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# 98944 SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: 12 GITDMER Examiner #: 69630 Date: 7/16/03  
 Art Unit: 1051 Phone Number 308-0732 Serial Number: 09/940,298  
 Mail Bdx and Bldg/Room Location: 11 B01 Results Format Preferred (circle): PAPER DISK E-MAIL  
11 D11

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*  
 Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

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	Type of Search	Vendors and cost where applicable
Searcher: <u>D. Schuler, B. G.</u>	NA Sequence (#) _____	STN <u>213, 29</u>
Searcher Phone #: <u>308-4292</u>	AA Sequence (#) _____	Dialog _____
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Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>74</u>	Other _____	Other (specify) _____

Gitomer 09/940,298

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(FILE 'MEDLINE, HCAPLUS, BIOSIS, EMBASE, SCISEARCH, AGRICOLA' ENTERED AT  
14:17:40 ON 31 JUL 2003)

L47 52 DUP REM L46 (54 DUPLICATES REMOVED)

=> d que 147

L3 11821 SEA THOMAS S?/AU  
L4 39 SEA L3 AND WASTEWATER  
L5 1 SEA L4 AND GLYCOGEN  
L12 32952 SEA (CONCENTRATION? OR LEVEL? OR AMOUNT? OR MEASUR? OR DETECT?  
OR ASSAY?) (5A) ((L6 OR L7 OR L8 OR L9 OR L10 OR L11))  
L13 6097 SEA (MONITOR? OR CONTROL? OR ADJUST?) (5A) ((L6 OR L7 OR L8 OR  
L9 OR L10 OR L11))  
L14 36929 SEA L12 OR L13  
L15 50 SEA L14 AND WASTEWATER  
L16 10179 SEA PROTEOBACTER?  
L17 7370 SEA PARACOCCLUS  
L18 12598 SEA RHODOCOCCLUS  
L19 298350 SEA PSEUDOMONAS  
L28 52268 SEA ACTIVATED(3A) SLUDGE#  
L29 54250 SEA ELECTRON(3A) ACCEPTOR#  
L30 585 SEA ((L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR L23 OR  
L24 OR L25 OR L26)) AND L28 AND (L29 OR OXYGEN OR NITRATE# OR  
NITRITE# OR NITROUS(A) OXIDE# OR FERRIC(A) OXIDE# OR SULFATE#  
OR SULPHATE#)  
L31 3127 SEA FEED(3A) NUTRIENT#  
L32 281 SEA L30 AND (L31 AND NITRATE# OR AMMONI? OR SULFATE# OR  
SULPHATE# OR SULFIDE# OR SULPHIDE# OR UREA# OR PHOSPHATE#)  
L33 42 SEA L32 AND ((L6 OR L7 OR L8 OR L9 OR L10 OR L11))  
L34 90 SEA L5 OR L15 OR L33  
L36 611 SEA DENITRIFICATION(5A) EFFICIENCY  
L37 91783 SEA (NITRATE# OR AMMONI? OR SULFATE# OR SULPHATE# OR PHOSPHATE#  
OR CARBON(A) DIOXIDE OR CO2) (3A) CONCENTRATION#  
L38 1486 SEA (L36 OR L37) AND ((L6 OR L7 OR L8 OR L9 OR L10 OR L11))  
L39 6 SEA L38 AND WASTEWATER  
L40 19 SEA L38 AND L28  
L41 54 SEA L38 AND ((L16 OR L17 OR L18 OR L19 OR L20 OR L21 OR L22 OR  
L23 OR L24 OR L25 OR L26))  
L42 148 SEA L34 OR L39 OR L40 OR L41  
L44 8 SEA L42 AND L29  
L46 106 SEA L34 OR L39 OR L40 OR L44  
L47 52 DUP REM L46 (54 DUPLICATES REMOVED)

=> d ibib abs 147 1-52

L47 ANSWER 1 OF 52 EMBASE COPYRIGHT 2003 ELSEVIER SCI. B.V. on STN  
ACCESSION NUMBER: 2003148132 EMBASE  
TITLE: Experimental and model assisted investigation of an  
operational strategy for the BPR under low influent  
concentrations.  
AUTHOR: Kruhne U.; Henze M.; Larose A.; Kolte-Olsen A.; Jorgensen  
S.B.  
CORPORATE SOURCE: U. Kruhne, Halmtorvet 7, st. th., Copenhagen V 1700,  
Denmark. kruehne@worldonline.dk  
SOURCE: Water Research, (2003) 37/8 (1953-1971).  
Refs: 18  
ISSN: 0043-1354 CODEN: WATRAG

COUNTRY: United Kingdom  
 DOCUMENT TYPE: Journal; Article  
 FILE SEGMENT: 029 Clinical Biochemistry  
 046 Environmental Health and Pollution Control  
 LANGUAGE: English  
 SUMMARY LANGUAGE: English

AB The behaviour of a pilot scale biological phosphorus removal process (BPR) of the alternating type was investigated during periods of low influent concentrations and increased hydraulic load. A process disturbance of this type result in an increase in the **phosphate concentration** level in the anoxic/aerobic reactors and in the plant effluent shortly after the influent **wastewater** returns to normal strength. The accumulation of phosphorus in the system was avoided by the addition of an external carbon source either to the influent or to the effluent from the anaerobic reactor in form of sodium acetate. With the help of such an addition, the internal carbon storage compounds could be maintained at a high level, which is shown by poly-hydroxy-alcanoates (PHA) measurements. Several levels of acetate addition were investigated experimentally in order to determine a minimal amount of internally stored carbon, which could ensure the stabilization of BPR during such dynamic influent conditions. Furthermore reduction of aeration time during periods of low influent concentrations was investigated. It was observed that BPR was stabilized by combining a reduction of aeration time with carbon source addition, which maintained the internal stored carbon at a higher level. This combined control action resulted in a desired high BPR activity when the normal strength of the influent **wastewater** was re-established. The failure of the BPR process was sometimes observed even when comparatively high concentrations of PHA could be detected and an identification of a minimal PHA level was not possible. During this investigation an extended version of the **activated sludge** model No. 2 (ASM2), which includes denitrification by phosphate accumulating organisms, is used for the detailed analysis of the experiments. The model predicted the phosphorus build-up after the process disturbance as well as the performance during the stabilized experiments. Assisted by the model, the investigations indicate that a PHA limitation is not the only factor affecting the recovery of the BPR process during periods of low influent concentrations. .COPYRG. 2002 Elsevier Science Ltd. All rights reserved.

L47 ANSWER 2 OF 52 MEDLINE on STN DUPLICATE 1  
 ACCESSION NUMBER: 2003124445 MEDLINE  
 DOCUMENT NUMBER: 22525171 PubMed ID: 12638699  
 TITLE: Denitrifying characteristics of the multiple stages enhanced biological nutrient removal process with external carbon sources.  
 AUTHOR: Chou Yu-Jan; Ouyang Chaio-Fuei; Kuo Wei-Liang; Huang Hau-Liang  
 CORPORATE SOURCE: Graduated Institute of Environmental Engineering, National Central University, Chungli, Taiwan, ROC..  
 yjchou@mail.ev.ncu.edu.tw  
 SOURCE: JOURNAL OF ENVIRONMENTAL SCIENCE AND HEALTH. PART A, TOXIC/HAZARDOUS SUBSTANCES & ENVIRONMENTAL ENGINEERING, (2003 Feb) 38 (2) 339-52.  
 Journal code: 9812551. ISSN: 1093-4529.  
 PUB. COUNTRY: United States  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 200306

ENTRY DATE: Entered STN: 20030318  
 Last Updated on STN: 20030608  
 Entered Medline: 20030606

AB This research investigated denitrifying activity of **activated sludge** with three external carbon sources (sodium acetate, methanol and glucose) via a series of batch experiments. **Activated sludge** used was cultivated in a multiple stages enhanced biological nutrient removal (EBNR) process that exhibited high removal efficiency of effective carbon, nitrogen, and phosphorus. Results showed type of external carbon source had a significant influence on specific nitrate utilization rate, nitrite accumulation, adaptive time of microorganisms, and nitrate removal efficiency. Sodium acetate addition resulted in high **phosphate concentration** in effluent; meanwhile methanol caused increasing turbidity and carbon breakthrough problem. When glucose was fed to be the external carbon source, accumulative nitrite concentration was higher than that with sodium acetate or methanol addition. When sodium acetate, methanol and glucose were used to be the electron donor, average dosages for nitrate elimination were 6.97, 5.85, and 5.65 mg-COD/mg-N, respectively. Because the final **polyhydroxyalkanoates** (PHAs) concentrations contained within the biomass were more than the original level and no phosphate re-release was observed, **glycogen**-accumulating organisms (GAOs) might exist in the multiple stages EBNR process and increased carbon dosage for further nitrate removal.

L47 ANSWER 3 OF 52 MEDLINE on STN  
 ACCESSION NUMBER: 2003334525 IN-PROCESS  
 DOCUMENT NUMBER: 22748884 PubMed ID: 12866848  
 TITLE: Long-term population dynamics and in situ physiology in activated sludge systems with enhanced biological phosphorus removal operated with and without nitrogen removal.  
 AUTHOR: Lee Natuschka; Nielsen Per H; Aspegren Henrik; Henze Mogens; Schleifer Karl-Heinz; la Cour Jansen Jes  
 CORPORATE SOURCE: Lehrstuhl fur Mikrobiologie, TU Munchen, Freising, Germany.. leen@micro.biologie.tu-muenchen.de  
 SOURCE: SYSTEMATIC AND APPLIED MICROBIOLOGY, (2003 Jun) 26 (2) 211-27.  
 Journal code: 8306133. ISSN: 0723-2020.  
 PUB. COUNTRY: Germany; Federal Republic of  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: IN-PROCESS; NONINDEXED; Priority Journals  
 ENTRY DATE: Entered STN: 20030718  
 Last Updated on STN: 20030718

AB Quantitative fluorescence in situ hybridization (FISH) and the combination of FISH with microautoradiography (MAR) were used in order to study the long-term population dynamics (2.5 years) and the in situ physiology in two parallel activated sludge pilot systems with enhanced biological phosphorus removal (EBPR). The two systems received the same influent **wastewater**, but were differently operated (with and without nitrogen removal, respectively). Both systems showed a significant P removal that increased when different substrates (phosphorus (P), acetate and glucose, respectively) were added to the influent **wastewater**. Rhodocyclus-related bacteria were present in both systems in significant numbers (ranging from 4 to 28%) throughout the whole period. This supports the hypothesis that these bacteria occur in significant numbers in different types of well-operating EBPR activated sludge processes. However, we observed a lower correlation (< 0.5) for the

amount of Rhodocyclus-related bacteria to the P content in activated sludge than previous studies ( $> 0.9$ ). The Actinobacteria were the only additional group of bacteria which showed a similar degree of correlation to the P content in activated sludge as the Rhodocyclus-related bacteria--but only for the system without nitrogen removal. Significant amounts ( $< \text{or} = 12\%$ ) of **glycogen**-accumulating bacteria (GAOs) were **detected** in the system with nitrogen removal (but not in the other system), but had no, in contrast to previous observations, apparent negative effect on the overall EBPR performance. FISH-MAR indicated that a significant part of the Betaproteobacteria (part of them identified as Rhodocyclus-related bacteria) as well as the Actinobacteria were able to take up  $^{33}\text{Pi}$ ,  $^{3}\text{H}$ -acetate and  $^{3}\text{H}$ -glucose under anaerobic-aerobic conditions. The contribution of anoxic  $^{33}\text{Pi}$  uptake under alternating anaerobic-anoxic conditions was significantly lower. Interestingly, not all Rhodocyclus-related bacteria showed uptake of these three radioactive substrates. This may be due to differences in metabolic state, physiological potential or genotype, not detectable by the present probe set for Rhodocyclus-related bacteria. Comparison of the  $^{33}\text{Pi}$ ,  $^{3}\text{H}$ -acetate and  $^{3}\text{H}$ -glucose uptake by activated sludge after different fixation and incubation procedures showed that a part of the observed  $^{33}\text{Pi}$  uptake may have been caused by a combination of a biological and chemical or biologically induced chemical P adsorption.

L47 ANSWER 4 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2002:185025 HCAPLUS  
 DOCUMENT NUMBER: 136:251844  
 TITLE: **Polyhydroxyalkanoate levels** as an indicator of bioreactor health  
 INVENTOR(S): Dragotta, Dominic A.; Nagarajan, Vasantha; Thomas, Stuart M.  
 PATENT ASSIGNEE(S): E.I. Dupont de Nemours and Company, USA  
 SOURCE: PCT Int. Appl., 39 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002020416	A2	20020314	WO 2001-US27456	20010904
WO 2002020416	A3	20020613		
W: CA, JP, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				

US 2002052016	A1	20020502	US 2001-940298	20010828
PRIORITY APPLN. INFO.:			US 2000-231025P	P 20000908

AB A method has been developed for monitoring and controlling the biocatalytic efficiency of a **wastewater** treatment process comprising: (a) providing an **activated sludge** environment; (b) sampling **wastewater** from anaerobic, anoxic and/or aerobic stages of the treatment process; (c) **measuring** the concn. of **polyhydroxyalkanoates** or **glycogen** present in the sample to det. the status of a selected sample characteristic; and (d) adjusting the **feed nutrient** in the **activated sludge** environment depending on the status of the selected sample wherein the biocatalytic efficiency of a **wastewater** treatment process is controlled. The **activated sludge** environment provided comprises: (i) a carbon influx; (ii)

cultures of autotrophic, heterotrophic and facultative microorganisms; (iii) a **feed nutrient**; and (iv) an end **electron acceptor**. In general, levels of PHA in excess of about 15 to about 20 dry wt. of the biomass is an indication that the biocatalytic efficiency of the **wastewater** treatment process is impaired.

L47 ANSWER 5 OF 52 MEDLINE on STN DUPLICATE 2  
 ACCESSION NUMBER: 2002684526 MEDLINE  
 DOCUMENT NUMBER: 22332295 PubMed ID: 12448508  
 TITLE: Modelling the start-up of a full-scale biological phosphorous and nitrogen removing WWTP.  
 AUTHOR: Meijer S C F; van Loosdrecht M C M; Heijnen J J  
 CORPORATE SOURCE: Kluyver Laboratory, Delft University of Technology, Netherlands.  
 SOURCE: WATER RESEARCH, (2002 Nov) 36 (19) 4667-82.  
 Journal code: 0105072. ISSN: 0043-1354.  
 PUB. COUNTRY: England: United Kingdom  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 200302  
 ENTRY DATE: Entered STN: 20021214  
 Last Updated on STN: 20030226  
 Entered Medline: 20030225

AB In this paper we simulated the start-up of a full-scale biological phosphorus and nitrogen removing (BPNR) **wastewater** treatment plant (wwtp). For the simulation we used a metabolic phosphorus model integrated in ASM2d, referred to as the Technical University Delft Phosphorus (TUDP) model. In a previous study it was shown that under steady state conditions the model is determined by stoichiometry rather than kinetics. To evaluate the kinetics of the metabolic biological phosphorus model, we recorded and simulated the start-up of a full-scale upgraded BPNR process. The initial state of the start-up was the simulated steady state of the process prior to the start-up. We could evaluate the SRT during the start-up on the basis of the accumulation of total-phosphorus in the sludge. During the start-up, the process changed from partly nitrifying to fully nitrifying, denitrifying and phosphate removing. Growth of PAO only showed sensitive for the glycogen formation rate kGLY. Disregarding a 20% in- or decrease of the kinetic rates of biological phosphorus removal (BPR), all start-up simulations converged to comparable steady states. This underlines that BPR is determined by stoichiometry rather than kinetics. Previous simulation studies with the TUDP-model showed that **glycogen** accumulated to unrealistic high **concentrations** with an increasing sludge retention time (SRT). We modelled the glycogen kinetics with a maximum glycogen fraction, which proved an effective and straightforward method to avoid unrealistic glycogen accumulation. In the steady state simulations, the **glycogen concentration** was determined by the value of the maximum glycogen fraction (fGLY(max)), whereas the overall sludge composition showed insensitive towards this parameter. Temperature appeared highly sensitive and therefore should not be neglected when modelling BPR.

L47 ANSWER 6 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
 ACCESSION NUMBER: 2002:563609 SCISEARCH  
 THE GENUINE ARTICLE: 569YV  
 TITLE: Members of the family Comamonadaceae as primary poly(3-**hydroxybutyrate-co-3-hydroxyvalerate**

)-degrading denitrifiers in **activated sludge** as revealed by a polyphasic approach  
 AUTHOR: Khan S T; Horiba Y; Yamamoto M; Hiraishi A (Reprint)  
 CORPORATE SOURCE: Toyohashi Univ Technol, Dept Ecol Engn, Tenpaku Cho, Toyohashi, Aichi 4418580, Japan (Reprint); Toyohashi Univ Technol, Dept Ecol Engn, Toyohashi, Aichi 4418580, Japan  
 COUNTRY OF AUTHOR: Japan  
 SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (JUL 2002) Vol. 68, No. 7, pp. 3206-3214.  
 Publisher: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904 USA.  
 ISSN: 0099-2240.  
 DOCUMENT TYPE: Article; Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 59

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The distribution and phylogenetic affiliations of poly (3-**hydroxybutyrate-co-3-hydroxyvalerate**) (PHBV)-degrading denitrifying bacteria in **activated sludge** were studied by a polyphasic approach including culture-independent biomarker and molecular analyses as well as cultivation methods. A total of 23 strains of PHBV-degrading denitrifiers were isolated from **activated sludges** from different sewage treatment plants. 16S ribosomal DNA (rdna) sequence comparisons showed that 20 of the isolates were identified as members of the family Comamonadaceae, a major group of beta-**Proteobacteria**. When the sludges from different plants were acclimated with PHBV under denitrifying conditions in laboratory scale reactors, the **nitrate** removal rate increased linearly during the first 4 weeks and reached 20 mg NO<sub>3</sub>-N h<sup>-1</sup> g of dry sludge<sup>-1</sup> at the steady state. The bacterial-community change in the laboratory scale sludges during the acclimation was monitored by rRNA-targeted fluorescence in situ hybridization and quinone profiling. Both approaches showed that the population of beta-Proteobacteria in the laboratory sludges increased sharply during acclimation regardless of their origins. 16S rDNA clone libraries were constructed from two different acclimated sludges, and a total of 37 clones from the libraries were phylogenetically analyzed. Most of the 16S rDNA clones were grouped with members of the family Comamonadaceae. The results of our polyphasic approach indicate that beta-Proteobacteria, especially members of the family Comamonadaceae, are primary PHBV-degrading denitrifiers in **activated sludge**. Our data provide useful information for the development of a new nitrogen removal system with solid biopolymer as an electron donor.

L47 ANSWER 7 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2002:619165 HCAPLUS  
 DOCUMENT NUMBER: 137:328934  
 TITLE: Use of CLPP to evaluate the role of different organic materials in composting  
 AUTHOR(S): Pinzari, F.; Tittarelli, F.; Benedetti, A.; Insam, H.  
 CORPORATE SOURCE: Istituto Sperimentale per la Nutrizione delle Piante di Roma, Rome, 00184, Italy  
 SOURCE: Microbiology of Composting, [Presentations given at the International Conference "Microbiology of Composting"], Innsbruck, Austria, Oct. 18-20, 2000 (2002), Meeting Date 2000, 383-396. Editor(s): Insam, Heribert; Klammer, Susanne; Riddech, Nuntavun.  
 Springer-Verlag: Berlin, Germany.  
 CODEN: 69CZAK; ISBN: 3-540-67568-X  
 DOCUMENT TYPE: Conference



LANGUAGE: English

AB Changes in the microbial functional diversity during composting were analyzed. Seven samples corresponding to (1) 3 different residues used in composting (sludges, citrus industrial processing waste, green wastes), and (2) 4 different stages of compost maturity were compared by their community level physiol. profiles (CLPP). Ecoplates (Biolog) were inoculated with compost and matrixes and incubated at 30.degree.; optical d. was measured every 8 h for 8 days. The samples were compared on the basis of the kinetics of the curves produced in each well. The data were used to calc. the area under the curve, and to study the curve kinetics. As a whole, the CLPP succeeded in addressing the role of different residues in the functional diversity of the mature compost. The microbial physiol. profile of the sludge was found in the final product, while no metabolic trace of the other 2 matrixes was found. The samples corresponding to different stages of the composting process were well characterized by their CLPP, showing an increase in the metabolic diversity during the stabilization process.

REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 8 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2002:836993 HCAPLUS

DOCUMENT NUMBER: 138:111363

TITLE: Effect of pH control on EBPR stability and efficiency

AUTHOR(S): Serafim, L. S.; Lemos, P. C.; Reis, M. A. M.

CORPORATE SOURCE: Chemistry Department, FCT/UNL, Caparica, 2829-516, Port.

SOURCE: Water Science and Technology (2002), 46(4-5, 2nd World Water Congress: Wastewater Treatment and Sludge Management, 2001), 179-184  
CODEN: WSTED4; ISSN: 0273-1223

PUBLISHER: IWA Publishing

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Biol. phosphorus removal from water surfaces is an important process for the control of eutrophication. Even though much attention has been devoted to understanding the metab. of bacteria and the effect of operational parameters on the efficiency of the phosphorus removal process, certain aspects are still unclear. The aim of this work was to evaluate the influence of pH control on the stability and efficiency of two sequencing batch reactors (SBR): one operated with pH control (pH 7.0) and the other without pH control (pH raised from around 7.8 to 8.5). The reactor operated without pH control showed higher efficiency on phosphorus removal and stability than the reactor with pH control. Based on the kinetics of both reactors it could be inferred that a different population developed in both systems.

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 9 OF 52 MEDLINE on STN DUPLICATE 3

ACCESSION NUMBER: 2002325377 MEDLINE

DOCUMENT NUMBER: 22063375 PubMed ID: 12067519

TITLE: Effects of culture conditions on the production of polyhydroxyalkanoates by Azotobacter chroococcum H23 in media containing a high concentration of alpechin (wastewater from olive oil mills) as primary carbon source.

AUTHOR: Pozo C; Martinez-Toledo M V; Rodelas B; Gonzalez-Lopez J

CORPORATE SOURCE: Group of Environmental Microbiology, Instituto del Agua,

Facultad de Farmacia, Universidad de Granada, Granada,  
Spain.. clpozo@ugr.es

SOURCE: JOURNAL OF BIOTECHNOLOGY, (2002 Aug 7) 97 (2) 125-31.  
Journal code: 8411927; ISSN: 0168-1656.  
PUB. COUNTRY: Netherlands  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 200210  
ENTRY DATE: Entered STN: 20020618  
Last Updated on STN: 20021010  
Entered Medline: 20021009

AB Large amounts of homopolymers containing beta-hydroxybutyrate (PHB) and copolymers containing beta-hydroxyvalerate (P[HB-co-HV]) are produced by Azotobacter chroococcum strain H23 when growing in culture media amended with alpechin (wastewater from olive oil mills) as the sole carbon source. Copolymer was formed when valerate (pentanoate) was added as a precursor to the alpechin medium, but it was not formed with the addition of propionate as a precursor. A. chroococcum formed homo- and copolymers of polyhydroxyalkanoates (PHAs) up to 80% of the cell dry weight, when grown on NH<sub>4</sub>(+)-medium supplemented with 60% (v/v) alpechin, after 48 h of incubation at 100 rev min<sup>-1</sup> and 30 degrees C. Production of PHAs by strain H23 using alpechin looks promising, as the use of a cheap substrate for the production of these materials is essential if bioplastics are to become competitive products.

L47 ANSWER 10 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2002:54074 HCAPLUS  
DOCUMENT NUMBER: 136:130069  
TITLE: Attenuated Carbohydrate and Gill Na<sup>+</sup>,K<sup>+</sup>-ATPase Stress Responses in Whitefish Caged near Bleached Kraft Mill Discharges  
AUTHOR(S): Lappivaara, Jarmo; Mikkonen, Jarno; Soimasuo, Markus  
CORPORATE SOURCE: Department of Biological and Environmental Science, University of Jyvaeskylae, Jyvaeskylae, FIN-40351, Finland  
SOURCE: Ecotoxicology and Environmental Safety (2002); 51(1), 5-11  
CODEN: EESADV; ISSN: 0147-6513  
PUBLISHER: Academic Press  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Exposure to biol. treated bleached kraft mill effluent (BKME) is demonstrated to greatly modify the acute physiol. stress response in fish and, accordingly, to lead to inconsistencies in data interpretation due to dissimilar effects of handling procedures on ref. and exposed fish. To consider this phenomenon, juvenile whitefish (Coregonus lavaretus) were caged for 30 days in four ref. sites and in three areas influenced by different BKME discharges. After exposure, fish were subjected to the impacts of low-level handling by raising the cages to the water surface, serially handnetting the fish, and transferring (.apprx.10 min) the submerged cages to the research vessel. The data on physiol. variables were pooled within each area to three groups according to the periods (<4 min, 10-20 min, 21-40 min) from the onset of handling to the sampling of individual fish. BKME-exposed whitefish sampled during the first period exhibited lower plasma cortisol and blood lactate levels and higher red blood cell Na<sup>+</sup> concns. than ref. fish sampled during the same period. In ref. whitefish, along with increased plasma cortisol and blood lactate

levels, gill ATPase activity as well as liver **glycogen** and blood glucose **levels** were markedly affected by the handling procedure, while the latter three responses were strongly attenuated in exposed whitefish. Red blood cell Na<sup>+</sup> and K<sup>+</sup> and blood Hb responses vanished in only one mill area. These findings, in accordance with similar results of earlier studies dealing with the same species, point to the need for this kind of time-dependent approach to achieve reliable and comparable outcomes in field expts. and encourage work on detg. the importance of functional deviations noted in fish exposed to anthropogenically modified water qualities. (c) 2002 Academic Press.

REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 11 OF 52 MEDLINE on STN DUPLICATE 4  
 ACCESSION NUMBER: 2001651015 MEDLINE  
 DOCUMENT NUMBER: 21536151 PubMed ID: 11679314  
 TITLE: Accumulation of **polyhydroxyalkanoic acid** containing large **amounts** of unsaturated monomers in *Pseudomonas fluorescens* BM07 utilizing saccharides and its inhibition by 2-bromooctanoic acid.  
 AUTHOR: Lee H J; Choi M H; Kim T U; Yoon S C  
 CORPORATE SOURCE: Division of Applied Life Sciences, Graduate School, Gyeongsang National University, Chinju 660-701, Korea.  
 SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (2001 Nov) 67 (11) 4963-74.  
 Journal code: 7605801. ISSN: 0099-2240.  
 PUB. COUNTRY: United States  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 200201  
 ENTRY DATE: Entered STN: 20011114  
 Last Updated on STN: 20020125  
 Entered Medline: 20020117

AB A psychrotrophic bacterium, *Pseudomonas fluorescens* BM07, which is able to accumulate **polyhydroxyalkanoic acid** (PHA) containing large **amounts** of 3-hydroxy-cis-5-dodecenoate unit up to 35 mol% in the cell from unrelated substrates such as fructose, succinate, etc., was isolated from an activated sludge in a municipal **wastewater** treatment plant. When it was grown on heptanoic acid (C(7)) to hexadecanoic acid (C(16)) as the sole carbon source, the monomer compositional characteristics of the synthesized PHA were similar to those observed in other fluorescent pseudomonads belonging to rRNA homology group I. However, growth on stearic acid (C(18)) led to no PHA accumulation, but instead free stearic acid was stored in the cell. The existence of the linkage between fatty acid de novo synthesis and PHA synthesis was confirmed by using inhibitors such as acrylic acid and two other compounds, 2-bromooctanoic acid and 4-pentenoic acid, which are known to inhibit beta-oxidation enzymes in animal cells. Acrylic acid completely inhibited PHA synthesis at a concentration of 4 mM in 40 mM octanoate-grown cells, but no inhibition of PHA synthesis occurred in 70 mM fructose-grown cells in the presence of 1 to 5 mM acrylic acid. 2-Bromooctanoic acid and 4-pentenoic acid were found to much inhibit PHA synthesis much more strongly in fructose-grown cells than in octanoate-grown cells over concentrations ranging from 1 to 5 mM. However, 2-bromooctanoic acid and 4-pentenoic acid did not inhibit cell growth at all in the fructose media. Especially, with the cells grown on fructose, 2-bromooctanoic acid exhibited a steep rise in the percent PHA synthesis inhibition over a small range of concentrations below 100

microM, a finding indicative of a very specific inhibition, whereas 4-pentenoic acid showed a broad, featureless concentration dependence, suggesting a rather nonspecific inhibition. The apparent inhibition constant  $K(i)$  (the concentration for 50% inhibition of PHA synthesis) for 2-bromooctanoic acid was determined to be 60 microM, assuming a single-site binding of the inhibitor at a specific inhibition site. Thus, it seems likely that a coenzyme A thioester derivative of 2-bromooctanoic acid specifically inhibits an enzyme linking the two pathways, fatty acid de novo synthesis and PHA synthesis. We suggest that 2-bromooctanoic acid can substitute for the far more expensive (2,000 times) and cell-growth-inhibiting PHA synthesis inhibitor, cerulenin.

L47 ANSWER 12 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 2002:74325 HCAPLUS

DOCUMENT NUMBER: 136:358928

TITLE: Removal behavior of biological nitrogen and phosphorus, and prediction of microbial community composition with its function, in an anaerobic-anoxic system from weak sewage

AUTHOR(S): Lee, Jin Woo; Choi, Eui So; Gil, Kyung Ik; Lee, Han Woong; Lee, Sang Hyon; Lee, Soo Youn; Park, Yong Keun

CORPORATE SOURCE: Department of Environmental System Engineering, Graduate School of Biotechnology, Korea University, Seoul, 136-701, S. Korea

SOURCE: Journal of Microbiology and Biotechnology (2001), 11(6), 994-1001

CODEN: JOMBES; ISSN: 1017-7825

PUBLISHER: Korean Society for Applied Microbiology

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An easier way to understand the BNR (biol. nutrient removal) system is proposed from studying substrate, nutrient removal tendency, and microbial community and its metabolic function in municipal settled wastewater. During the anaerobic period, the P release rate per VFACOD (volatile fatty acid COD) was varied depending on the P content in sludge. When sludge P content was 6% volatile suspended solids (VSS) according to influent VFACOD, the P release rate and PHA (polyhydroxy alkanonate) prodn. were 0.35 g PO<sub>4</sub><sup>3-</sup>-P/g VFACOD and 1.0 g PHA/g VFACOD, resp. NO<sub>3</sub><sup>-</sup>-N requirement for P uptake as an **electron acceptor** was .apprx.0.5 g NO<sub>3</sub><sup>-</sup>-N/g PO<sub>4</sub><sup>3-</sup>-P uptake, based on the proposed equation with PHA, biomass prodn., and the release/uptake P concn. Bacterial-community anal. of sludge was detd. by FISH (fluorescence in-situ hybridization) and 16S rDNA characterization. FISH showed .beta.-subclass **Proteobacteria** were the most abundant group (27.9% of **Proteobacteria**-specific probe EUB338); it was likely that representatives of the .beta.-subclass played key roles in **activated sludge**. The next dominant group was the .gamma.-**Proteobacteria** (15.4% of probe EUB338). 16S rDNA clone library anal. showed that members of .beta.- and .gamma.-**Proteobacteria** were also the most abundant groups; 21.5% (PN2 and PN4) and 15.4% (PN1 and PN5) of total clones were the genera of denitrifying bacteria and PAO, resp. Microbial community compn. was predicted by P content (Pv, percent P/VSS) in waste sludge and COD, PHA, PO<sub>4</sub><sup>3-</sup>-P, and NO<sub>3</sub><sup>-</sup>-N profiles in an anaerobic-anoxic sequencing batch reactor unit. Generally, predicted microbial compn. based on metabolic function, i.e., as measured by stoichiometry, was fairly similar to that measured by the unculturable dependent method. A proposal was made concerning the microbial community compn. that was more easily approachable for reactor behavior anal.

REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 13 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2002:59365 HCAPLUS  
 DOCUMENT NUMBER: 137:10501  
 TITLE: Alteration in the gonads of *Clarias batrachus* linn. following exposure to paper mill effluent  
 AUTHOR(S): Mishra, Anju; Pandey, G. C.; Pandey, A. C.; Shukla, Siddharth  
 CORPORATE SOURCE: Department of Environmental Sciences, Dr. R.M.L. Avadh University, Faizabad, 224 001, India  
 SOURCE: Journal of Industrial Pollution Control (2001), 17(2), 219-223  
 CODEN: JIPCE4; ISSN: 0970-2083  
 PUBLISHER: Enviro Media  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Changes induced by paper mill effluent concns. (20, 60, and 100%) was obsd. on gonadal wt. and **levels** of protein, **glycogen**, and cholesterol in the tissues of *C. batrachus* after 30 days exposure. The gonadal wt. and **levels** of protein, **glycogen**, and cholesterol in the testes and ovaries were more or less similar in control as well as in 20% effluent concn. exposure. However, remarkable increase in gonadal wt. and its tissue glycogen and cholesterol were obsd. in the fish exposed to 60 and 100% effluent concn. In contrast, significant decrease in gonadal protein was recorded in exposed fishes at higher concns. The probable reasons for the alterations in gonadal wt. and biochem. constituents are discussed.  
 REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 14 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
 ACCESSION NUMBER: 2001:279067 SCISEARCH  
 THE GENUINE ARTICLE: 415NY  
 TITLE: In situ identification of polyphosphate- and **polyhydroxyalkanoate**-accumulating traits for microbial populations in a biological phosphorus removal process  
 AUTHOR: Liu W T (Reprint); Nielsen A T; Wu J H; Tsai C S; Matsuo Y; Molin S  
 CORPORATE SOURCE: Natl Cent Univ, Grad Inst Environm Engn, Chungli 32054, Taiwan (Reprint); Tech Univ Denmark, Dept Microbiol, Mol Microbial Ecol Grp, DK-2800 Lyngby, Denmark; Natl Cheng Kung Univ, Dept Environm Engn, Tainan 70101, Taiwan; Chuo Univ, Dept Civil Engn, Tokyo 112, Japan  
 COUNTRY OF AUTHOR: Taiwan; Denmark; Japan  
 SOURCE: ENVIRONMENTAL MICROBIOLOGY, (FEB 2001) Vol. 3, No. 2, pp. 110-122.  
 Publisher: BLACKWELL SCIENCE LTD, P O BOX 88, OSNEY MEAD, OXFORD OX2 ONE, OXON, ENGLAND.  
 ISSN: 1462-2912.  
 DOCUMENT TYPE: Article; Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 49

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Polyphosphate- and **polyhydroxyalkanoate** (PHA)- accumulating traits of predominant microorganisms in an efficient enhanced biological phosphorus removal (EBPR) process were investigated systematically using a suite of non-culture-dependent methods. Results of 16S rDNA clone library

and fluorescence in situ hybridization (FISH) with rRNA-targeted, group-specific oligonucleotide probes indicated that the microbial community consisted mostly of the alpha- (9.5% of total cells), beta- (41.3%) and gamma- (6.8%) subclasses of the class **Proteobacteria**, Flexibacter-Cytophaga (4.5%) and the Gram-positive high G+C (HGC) group (17.9%). With individual phylogenetic groups or subgroups, members of Candidatus Accumulibacter phosphatis in the beta -2 subclass, a novel HGC group closely related to Tetrasphaera spp., and a novel gamma - **proteobacterial** group were the predominant populations. Furthermore, electron microscopy with energy-dispersive X-ray analysis was used to validate the staining specificity of 4,6-diamino-2-phenylindole (DAPI) for intracellular polyphosphate and revealed the composition of polyphosphate granules accumulated in predominant bacteria as mostly P, Ca and Na. As a result, DAPI and PHA staining procedures could be combined with FISH to identify directly the polyphosphate- and PHA-accumulating traits of different phylogenetic groups. Members of Accumulibacter phosphatis and the novel gamma-**proteobacterial** group were observed to accumulate both polyphosphate and PHA. In addition, one novel rod-shaped group, closely related to coccus-shaped Tetrasphaera, and one filamentous group resembling Candidatus Nostocoidia limicola in the HGC group were found to accumulate polyphosphate but not PHA. No cellular inclusions were detected in most members of the alpha - **Proteobacteria** and the Cytophaga-Flavobacterium group. The diversified functional traits observed suggested that different substrate metabolisms were used by predominant phylogenetic groups in EBPR processes.

L47 ANSWER 15 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2001:398168 HCAPLUS  
 DOCUMENT NUMBER: 135:72367  
 TITLE: Effects of Acute Handling Stress on Whitefish  
 Coregonus lavaretus After Prolonged Exposure to  
 Biologically Treated and Untreated Bleached Kraft Mill  
 Effluent  
 AUTHOR(S): Lappivaara, J.  
 CORPORATE SOURCE: Department of Biological and Environmental Science,  
 University of Jyväskylä, Jyväskylä, FIN-40351, Finland  
 SOURCE: Archives of Environmental Contamination and Toxicology  
 (2001), 41(1), 55-64  
 CODEN: AECTCV; ISSN: 0090-4341  
 PUBLISHER: Springer-Verlag New York Inc.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Exposure of fish to water of impaired quality has been shown to disrupt  
 the function of the hypothalamo-pituitary-interrenal (HPI) axis and alter  
 the interpretation of data from field studies due to the varying effects  
 of handling and delayed sampling on exposed and ref. animals. In the  
 present study, juvenile whitefish, Coregonus lavaretus, were exposed for 6  
 wk to dild. (4-8%) untreated and biol. treated bleached kraft mill  
 effluent (BKME) and their response to acute handling was investigated.  
 Liver microsomal EROD activity and glycogen phosphorylase (GPase)  
 activity, in addn. to gill Na+-K+-ATPase activity, and blood Hb and  
 hematocrit levels were increased in whitefish exposed for 6 wk to  
 untreated BKME, whereas those exposed to treated BKME exhibited increased  
 blood Hb and red blood cell K+ concns. Both handling procedures, exposure  
 to a shallow water (10 cm, 5 min) and to an air challenge (10 s air/10 s  
 water/30 s air/10 s water/10 s air), resulted in acute physiol. stress, as  
 recorded after 5-, 60-, and 120-min recovery periods. Following air  
 exposure, the levels of plasma cortisol, blood glucose, Hb, and hematocrit

as well as the liver GPase activity were increased, and liver **glycogen** concn. decreased in **control** fish. These responses were attenuated in fish exposed to untreated or treated BKME. Plasma estradiol and testosterone levels were not affected by the BKME exposures or by the air challenge. Handling also resulted in attenuated EROD induction in fish exposed to untreated BKME. According to the present findings, the sensitivity of some widely used cellular and physiol. variables may be improved by time-dependent standardization when interpreting data obtained following delayed sampling.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 16 OF 52 MEDLINE on STN DUPLICATE 5  
 ACCESSION NUMBER: 2000164027 MEDLINE  
 DOCUMENT NUMBER: 20164027 PubMed ID: 10698794  
 TITLE: Atypical polyphosphate accumulation by the denitrifying bacterium **Paracoccus** denitrificans.  
 AUTHOR: Barak Y; van Rijn J  
 CORPORATE SOURCE: Department of Animal Science, Faculty of Agricultural, Food and Environmental Quality Sciences, The Hebrew University of Jerusalem, Rehovot 76100, Israel.  
 SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (2000 Mar) 66 (3) 1209-12.  
 Journal code: 7605801. ISSN: 0099-2240.  
 PUB. COUNTRY: United States  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 200004  
 ENTRY DATE: Entered STN: 20000505  
 Last Updated on STN: 20000505  
 Entered Medline: 20000424

AB Polyphosphate accumulation by **Paracoccus** denitrificans was examined under aerobic, anoxic, and anaerobic conditions. Polyphosphate synthesis by this denitrifier took place with either **oxygen** or **nitrate** as the **electron acceptor** and in the presence of an external carbon source. Cells were capable of poly-beta-**hydroxybutyrate** (PHB) synthesis, but no polyphosphate was produced when PHB-rich cells were incubated under anoxic conditions in the absence of an external carbon source. By comparison of these findings to those with polyphosphate-accumulating organisms thought to be responsible for **phosphate** removal in **activated sludge** systems, it is concluded that *P. denitrificans* is capable of combined **phosphate** and **nitrate** removal without the need for alternating anaerobic/aerobic or anaerobic/anoxic switches. Studies on additional denitrifying isolates from a denitrifying fluidized bed reactor suggested that polyphosphate accumulation is widespread among denitrifiers.

L47 ANSWER 17 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2000:818319 HCAPLUS  
 DOCUMENT NUMBER: 134:105099  
 TITLE: The characteristic of phosphorus uptake/release of a nutrient removal process under anoxic condition  
 AUTHOR(S): You, S. J.; Lin, S. F.; Liu, W. T.; Ouyang, C. F.  
 CORPORATE SOURCE: Graduate Institute of Environmental Engineering, National Central University, Chungli, Taiwan  
 SOURCE: Zhongguo Huanjing Gongcheng Xuekan (2000), 10(3), 249-254

CODEN: ZHGXEL; ISSN: 1022-7636

PUBLISHER: Chinese Institute of Environmental Engineering  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB This study investigated the characteristics of phosphorus uptake/release in a nutrient removal process in the anoxic phase at low/high intracellular storage polymer with/without carbon source added. The sludge was taken from TNCU-I, a combined **activated-sludge** and biofilm process. The results showed low efficiencies of denitrification/phosphate release while the sludge had low intracellular polymer without added carbon. When the sludge had added carbon under low intracellular polymer conditions, the efficiencies of the denitrification/phosphate uptake and the PHA ( **polyhydroxyalkanoates**) accumulation were increased obviously. These results indicated that the microorganisms could release phosphate and store PHAs under anoxic conditions while sol. carbon source was present. However, when the sludge had high intracellular polymer without added carbon, the efficiencies of denitrification/phosphate uptake increased while the phosphate concn. increased in the bulk soln., but the amt. of accumulating PHAs did not change. This implied that other intracellular polymers, but not PHAs, supplied the energy consumed for denitrification/phosphate uptake. Addnl., when carbon was added to the sludge with high intracellular polymer, the **efficiency** of **denitrification** and the amt. of accumulating PHAs were higher, but the amt. of phosphate uptake was obviously quite lower than that under the condition of high intracellular polymer without carbon added.

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 18 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
ACCESSION NUMBER: 2000:251546 BIOSIS  
DOCUMENT NUMBER: PREV200000251546  
TITLE: Micropruina glycogenica gen. nov., sp. nov., a new Gram-positive glycogen-accumulating bacterium isolated from activated sludge.  
AUTHOR(S): Shintani, Tomoyoshi; Liu, Wen-Tso; Hanada, Satoshi; Kamagata, Yoichi; Miyaoka, Shunsuke; Suzuki, Takaaki; Nakamura, Kazunori (1)  
CORPORATE SOURCE: (1) Agency of Industrial Science and Technology, National Institute of Bioscience and Human-Technology, 1-1 Higashi, Tsukuba, Ibaraki, 305-8566 Japan  
SOURCE: International Journal of Systematic and Evolutionary Microbiology, (Jan., 2000) Vol. 50, No. 6 part 1, pp. 201-207.  
ISSN: 1466-5026.  
DOCUMENT TYPE: Article  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB A new Gram-positive non-spore-forming bacterium, strain Lg2T, was isolated from an activated sludge reactor showing enhanced biological phosphorus removal activity. The new isolate was a slowly growing organism and was capable of accumulating large **amounts** of intracellular **glycogen** from substrate taken up. Both oxidase and catalase were produced. The new isolate contained meso-diaminopimelic acid (DAP) in the cell wall. Complex fatty acid patterns with iso-C14:0, anteiso-C15:0, C16:0, iso-C16:0 and four other minor saturated or unsaturated straight-chain fatty acids were detected. The isolate contained a high genomic G+C content (70.5 mol%). Phylogenetic analysis based on the 16S rRNA gene sequence placed the isolate in the high G+C Gram-positive group



with *Micrococcus phosphovorus* and *Friedmanniella antarctica* as the closest relatives (sequence similarities are 93 and 92%, respectively). These three organisms shared common features in morphology, but strain Lg2T could be differentiated from the other species by its peptidoglycan type (meso-DAP), fatty acid composition, carbon source utilization profile and G+C content. On the basis of these findings, it is proposed that a new genus and species, *Micropruina glycogenica*, should be created for the new isolate; the type strain is strain Lg2T (= JCM 10248T).

L47 ANSWER 19 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
 ACCESSION NUMBER: 2000:44455 SCISEARCH  
 THE GENUINE ARTICLE: 272GW  
 TITLE: Microbial synthesis and characterization of **polyhydroxyalkanoates** by DG17 from glucose  
 AUTHOR: He W N (Reprint); Zhang Z M; Hu P; Chen C Q  
 CORPORATE SOURCE: TSING HUA UNIV, DEPT CHEM ENGN, BEIJING 100084, PEOPLES R CHINA (Reprint); TSING HUA UNIV, DEPT BIOL SCI & BIOTECHNOL, BEIJING 100084, PEOPLES R CHINA  
 COUNTRY OF AUTHOR: PEOPLES R CHINA  
 SOURCE: ACTA POLYMERICA SINICA, (DEC 1999) No. 6, pp. 709-714. Publisher: SCIENCE PRESS, 16 DONGHUANGCHENGGEN NORTH ST, BEIJING 100717, PEOPLES R CHINA. ISSN: 1000-3304.  
 DOCUMENT TYPE: Article; Journal  
 LANGUAGE: Chinese  
 REFERENCE COUNT: 4

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Poly(3-hydroxyalkanoates), abbreviated as PHAs are a series of bacterial storage polyesters, currently receiving much attention because of their potential application as biodegradable, biocompatible materials. This paper studied the influence of glucose as the carbon source, nitrogen source, and phosphate on the structure of polymer synthesized by DG17, a mutant isolated from oilfield. The structure of polymer was determined by gas chromatograph(GC), nuclear magnetic resonance(NMR) analysis. Under the experimental conditions, a thermoplastic elastomer P(HO-co-HD) with molecular weight  $1.16 \times 10^5$  was synthesized when **concentration** of **ammonium sulfate** were not over 1g/L. But thermoplastics PHB was isolated from cells when **concentration** of **ammonium sulfate** was up to 8g/L. During these two concentrations, no polymer was found in cells. **Concentrations** of nitrogen and **phosphate** maybe have great influence on the pathway of PHA synthesis. 5 was the lowest weight ratio of glucose to ammonium sulfate needed for DG17 to accumulated PHA in cells. Both P(HO-co-HD) and PHB synthesized by DG17 from glucose lost up to 90% weights in **activated sludge** in one month.

L47 ANSWER 20 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN  
 ACCESSION NUMBER: 2000:110271 HCAPLUS  
 DOCUMENT NUMBER: 132:275292  
 TITLE: Biomarker responses in fish exposed to effluent from bleached sulfite pulp production  
 AUTHOR(S): Johnsen, Kjell; Tana, Jukka; Lehtinen, Karl-Johan; Carlberg, Georg E.  
 CORPORATE SOURCE: The Norwegian Pulp and Paper Research Institute, Oslo, N-0313, Norway  
 SOURCE: Boreal Environment Research (1999), 4(4), 377-386 CODEN: BERE77; ISSN: 1239-6095  
 PUBLISHER: Finnish Zoological and Botanical Publishing Board  
 DOCUMENT TYPE: Journal

LANGUAGE: English

AB The effects of biol. treated effluents from bleached sulfite pulp prodn. were studied using brown trout (*Salmo trutta*) as test organism. Continuous-flow exposures under lab. conditions were conducted at two dilns. (1:40 and 1:400) for eight weeks, followed by a six-week recovery period. Physiol. and biochem. biomarkers including liver histol., hematomol. and hepatic enzyme assays were used and the exposure was verified by analyzing fish bile and fish tissue concns. of resin acids and chlorophenols. The conjugated chlorophenols and resin acids levels in the exposed fish bile are considered as low. Only two significant responses were obsd., both in liver function. The MFO assocd. EROD activity was induced parallel to lower liver **glycogen levels**. Otherwise, the changes in physiol. parameters analyzed were few as compared to ref. fish. The small differences in physiol. parameters between the ref. group and the exposure group (1:40) after six-week recovery period show that the obsd. responses were reversible. The spectrum and pattern of results obsd. in this study are very much the same as seen in lab. and field studies with bleached kraft mill effluents from modern mills.

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 21 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1999:358773 HCAPLUS

DOCUMENT NUMBER: 131:62791

TITLE: Possible uses of enzymic test methods in advanced **wastewater** treatment

AUTHOR(S): Filipov, Ellen

CORPORATE SOURCE: Ronnenberg/Empelde, 30952, Germany

SOURCE: Veroeffentlichungen des Institutes fuer Siedlungswasserwirtschaft und Abfalltechnik der Universitaet Hannover (1999), (105), A, B, i-xviii, 1-266  
CODEN: VISAF4

PUBLISHER: Institut fuer Siedlungswasserwirtschaft und Abfalltechnik der Universitaet Hannover

DOCUMENT TYPE: Journal

LANGUAGE: German

AB Studies on the application of poly-P-kinase, a key enzyme of phosphate formation, and hydroxybutyrate dehydrogenase, a key enzyme of **polyhydroxybutyric** acid degrdn., for **monitoring** activated sludge treatment process with enhanced P elimination are reported.

REFERENCE COUNT: 149 THERE ARE 149 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 22 OF 52 MEDLINE on STN DUPLICATE 6

ACCESSION NUMBER: 1998353380 MEDLINE

DOCUMENT NUMBER: 98353380 PubMed ID: 9687452

TITLE: Inhibition of anaerobic **phosphate** release by nitric oxide in **activated sludge**.

AUTHOR: Van Niel E W; Appeldoorn K J; Zehnder A J; Kortstee G J

CORPORATE SOURCE: Department of Applied Microbiology, Lund University, S-22100 Lund, Sweden.

SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (1998 Aug) 64 (8) 2925-30.

Journal code: 7605801. ISSN: 0099-2240.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 199809  
 ENTRY DATE: Entered STN: 19981006  
 Last Updated on STN: 19981006  
 Entered Medline: 19980924

AB **Activated sludge** not containing significant numbers of denitrifying, polyphosphate [poly(P)]-accumulating bacteria was grown in a fill-and-draw system and exposed to alternating anaerobic and aerobic periods. During the aerobic period, poly(P) accumulated up to 100 mg of P x g of (dry) weight. When portions of the sludge were incubated anaerobically in the presence of acetate, 80 to 90% of the intracellular poly(P) was degraded and released as orthophosphate. Degradation of poly(P) was mainly catalyzed by the concerted action of polyphosphate:AMP phosphotransferase and adenylate kinase, resulting in ATP formation. In the presence of 0.3 mM nitric oxide (NO) in the liquid-phase release of **phosphate**, uptake of acetate, formation of poly-beta-hydroxybutyrate, utilization of **glycogen**, and formation of ATP were severely inhibited or completely abolished. In cell extracts of the sludge, adenylate kinase activity was completely inhibited by 0.15 mM NO. The nature of this inhibition was probably noncompetitive, similar to that with hog adenylate kinase. **Activated sludge** polyphosphate glucokinase was also completely inhibited by 0.15 mM NO. It is concluded that the inhibitory effect of NO on acetate-mediated **phosphate** release by the sludge used in this study is due to the inhibition of adenylate kinase in the **phosphate**-releasing organisms. The inhibitory effect of **nitrate** and **nitrite** on **phosphate** release is probably due to their conversion to NO. The lack of any inhibitory effect of NO on adenylate kinase of the poly(P)-accumulating **Acinetobacter johnsonii** 210A suggests that this type of organism is not involved in the enhanced biological **phosphate** removal by the sludges used.

L47 ANSWER 23 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1998:325234 BIOSIS  
 DOCUMENT NUMBER: PREV199800325234  
 TITLE: Effect of carbon source on the formation of polyhydroxyalkanoates (PHA) by a phosphate-accumulating mixed culture.  
 AUTHOR(S): Lemos, P. C.; Viana, C.; Salgueiro, E. N.; Ramos, A. M.; Crespo, J. P. S. G.; Reis, M. A. M. (1)  
 CORPORATE SOURCE: (1) Dep. Quim., Fac. Cienc. Tecnol., Univ. Nova Lisboa, 2825 Monte de Caparica Portugal  
 SOURCE: Enzyme and Microbial Technology, (June, 1998) Vol. 22, No. 8, pp. 662-671.  
 ISSN: 0141-0229.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English

AB In the present work, attention was devoted to understand how different carbon substrates and their concentration can influence the production of PHA by polyphosphate-accumulating bacteria. Acetate, propionate, and butyrate were tested independently. The composition of the polymers formed was found to vary with the substrate used. Acetate leads to the production of a copolymer of hydroxybutyrate (HB) and hydroxyvalerate (HV) with the HB units being dominant. With propionate, HV units are mainly produced and only a small amount of HB is synthesized. When butyrate is used, the amount of polymer formed is much lower with the HB units being produced to a higher extent. The yield of polymer produced per carbon consumed (YP/S)

was found to diminish from acetate (0.97) to propionate (0.61) to butyrate (0.21). Using a mixture of acetate, propionate, and butyrate and increasing the carbon concentration, although maintaining the relative concentration of each substrate, propionate is primarily consumed and consequently, PHA synthesized was enriched in HV units. The polymers obtained in all experiments were copolymers with the average molecular weight of the most representative fraction higher when **hydroxybutyrate** units were present in considerable amounts. All the polymers synthesized were found to be quite homogeneous and their average molecular weight is of the same order of magnitude as the ones commercially available.

L47 ANSWER 24 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 7  
 ACCESSION NUMBER: 1998:401577 HCAPLUS  
 DOCUMENT NUMBER: 129:99372  
 TITLE: Bioassay for glycogen determination in biological phosphorus removal systems  
 AUTHOR(S): Brdjanovic, Damir; Van Loosdrecht, Mark C. M.; Hooijmans, Christine M.; Mino, Takashi; Alaerts, Guy J.; Heijnen, Joseph J.  
 CORPORATE SOURCE: Department of Environmental Engineering, International Institute for Infrastructural, Hydraulic and Environmental Engineering IHE Delft, Delft, 2601 DA, Neth.  
 SOURCE: Water Science and Technology (1998), 37(4-5, Microorganisms in Activated Sludge and Biofilm Processes II), 541-547  
 CODEN: WSTED4; ISSN: 0273-1223  
 PUBLISHER: Elsevier Science Ltd.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Glycogen plays an important role in biol. phosphorus removal from wastewaters. Existing **measurement** techniques often overestimate the **glycogen** content of the biomass due to the presence of glucose and/or other carbohydrates than glycogen in the cell material. As an alternative to conventional methods, a bioassay for glycogen detn. in biol. phosphorus removal systems was developed. The bioassay is based on the strict stoichiometric coupling between anaerobic acetate uptake and glycogen consumption. In other words, the glycogen concn. of the sludge was detd. indirectly by measuring the maximal total acetate uptake by the activated sludge in anaerobic batch tests. The bioassay was successfully tested for the detn. of glycogen content of the sludge taken from the lab-scale, acetate-fed, anaerobic-aerobic-settling sequencing batch reactor operating at pH 7.+-0.1 and temp. of 20.degree.C. This detn. of glycogen requires that glycogen (not poly-P) is the limiting factor for anaerobic acetate uptake. A method to verify this assumption based on the effect of pH on phosphate/acetate ratio is proposed and used. The bioassay is easy to apply and gives a direct **measure** of the **glycogen** content of bio-P bacteria, but its reliability still needs to be verified at full-scale biol. P-removal plants.  
 REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 25 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
 ACCESSION NUMBER: 1998:696503 SCISEARCH  
 THE GENUINE ARTICLE: 117FQ  
 TITLE: Enzymatic degradation of poly(hydroxyalkanoate) by Corynebacterium aquaticum IM-1 isolated from **activated sludge**

AUTHOR: Ito M (Reprint); Saito Y; Matsunobu T; Hiruta O; Takebe H.  
 CORPORATE SOURCE: TAISEI CORP, TECHNOL RES CTR, AKANEHAMA 3-6-2, NARASHINO, CHIBA 275, JAPAN (Reprint); MEIJI SEIKA KAISHA LTD, PHARMACEUT TECHNOL LABS, ODAWARA 250, JAPAN  
 COUNTRY OF AUTHOR: JAPAN  
 SOURCE: POLYMER DEGRADATION AND STABILITY, (JUL 1998) Vol. 61, No. 2, pp. 319-327.  
 Publisher: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, OXON, ENGLAND.  
 ISSN: 0141-3910.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: PHYS  
 LANGUAGE: English  
 REFERENCE COUNT: 36

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Poly(4-**hydroxybutyric** acid)-degrading bacteria were isolated from **activated sludge**. One strain was selected, which was identified as *Corynebacterium aquaticum*. The strain C. *aquaticum* IM-I excreted an extracellular poly(hydroxyalkanoate) [PHA] depolymerase and grew on 4-**hydroxybutyric** acid as the sole carbon source. The PHA depolymerase was purified from the cultured broth medium containing 4-**hydroxybutyric** acid as the sole carbon source by ultra-filtration, gel filtration and hydrophobic column chromatography. The molecular weight of the depolymerase was determined as approximately 33000 Da by polyacrylamide gel electrophoresis in the presence of sodium dodecyl **sulfate**. The optimum activity of the depolymerase on the degradation of poly(4-**hydroxybutyrate**) (P(4HB)) was observed at pH 6.5 and 40 degrees C. Lipase activity of the depolymerase was not detected, and N-terminal sequences of the depolymerase were not applicable to the well-known enzymes. The enzymatic degradation of polyesters was studied by the erosion rate of solution-cast films of poly(3-**hydroxybutyrate-co-4-hydroxybutyrate**) and poly(omega-hydroxyalkanoate) of different chain lengths (C3-C6). The water-soluble products of poly(3-**hydroxybutyrate-co-97 mol%4-hydroxybutyrate**) film were revealed by H-1 NMR and FAB-MS analysis, and the main product was the dimer of 4-**hydroxybutyric** acid. (C) 1998 Elsevier Science Limited. All rights reserved.

L47 ANSWER 26 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 8  
 ACCESSION NUMBER: 1998:755677 HCAPLUS  
 DOCUMENT NUMBER: 130:85351  
 TITLE: Effect of wastewater composition on microbial populations in biological phosphorus removal processes  
 AUTHOR(S): Wang, J. C.; Park, J. K.  
 CORPORATE SOURCE: Procorp, Inc., Wauwatosa, WI, 53226, USA  
 SOURCE: Water Science and Technology (1998), 38(1, Water Quality International '98, Part 1), 159-166  
 CODEN: WSTED4; ISSN: 0273-1223  
 PUBLISHER: Elsevier Science Ltd.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Bench-scale sequential batch reactors (SBRs) were fed with glucose- and acetate-contg. synthetic wastewaters to evaluate microbial population dynamics and types of phosphorus-accumulating organisms (PAOs) using a cellular fatty acid profile anal. The P content in the sludge was 38% for the acetate-fed SBR and 20% for the glucose-fed SBR with a VSS/TSS ratio of 50%. Glucose-fed PAOs removed P with accumulation of **glycogen** in cells without synthesizing poly- $\beta$ -**hydroxybutyrate** (PHB) at influent P concn. <20 mg-P/L and NO<sub>3</sub>- concn. <2 mg-N/L. From the fatty

acid profile biomarker study, it was found that the glucose-fed SBR maintained the same fatty acid profile before and after biol. phosphorus removal (BPR) occurred while the acetate-fed SBR had a different fatty acid profile. The microbial population in the glucose-fed SBR was significantly different in terms of metabolic behavior and cellular fatty acid profile from that introduced in the acetate-fed SBR. Anteiso pentadecanoic acid (a15:0) was abundant in the glucose-fed PAOs. Among the 5 PAO candidates (**Acinetobacter**, **Pseudomonas**, **Arthrobacter**, **Aeromonas**, and **Micrococcus**), only **Arthrobacter** spp. had the biomarker of fatty acid a15:0, indicating that **Arthrobacter** spp. may be one of the PAOs existing in the glucose-fed bioreactors.

REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 27 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1998:755671 HCAPLUS

DOCUMENT NUMBER: 130:85346

TITLE: Evaluation of phosphorus removal in anaerobic-anoxic-aerobic system - via polyhydroxyalkanoates measurements

AUTHOR(S): Chuang, S. H.; Ouyang, C. F.; Yuang, H. C.; You, S. J.

CORPORATE SOURCE: Graduate Institute of Environmental Engineering, National Central University, Chungli, 320, Taiwan

SOURCE: Water Science and Technology (1998), 38(1, Water Quality International '98, Part 1), 107-114

CODEN: WSTED4; ISSN: 0273-1223

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Accumulating and utilizing polyhydroxyalkanoates (PHAs), a major carbon reserve formed in polyphosphate accumulating organisms (PAOs), is a prerequisite for phosphorus removal in an enhanced biol. phosphorus removal (EBPR) system. To evaluate P removal, the behavior of PHAs in a hybrid anaerobic-anoxic-aerobic process was studied, operating under various sludge retention times (5, 10, 12, and 15 days) and dissolved oxygen conditions (0.5, 1.0, and 2.0 mg/L in aerobic stage). PHAs and P measurements in the pilot-scale expts. demonstrate that the PHA content of sludge closely relates to P release and uptake behaviors under anaerobic and aerobic conditions, resp. The aerobic specific P uptake rate is directly proportional to PHA content of sludge in the anoxic stage. When the process is under a high org. loading condition, the sludge exhibits a large amt. of PHAs having accumulated in the anoxic stage and a high P uptake rate in the subsequent aerobic stage. However, exptl. results confirm that anoxic P release, leading to a high concn. of P flow into the aerobic stage, causes deficient P removal under a high org. loading condition. Moreover, a low PHA content of sludge causes incomplete P removal; the phenomenon occurs when the process is under a low org. loading condition.

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L47 ANSWER 28 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 9

ACCESSION NUMBER: 1997:208813 HCAPLUS

DOCUMENT NUMBER: 126:282121

TITLE: Intracellular carbon flow in phosphorus accumulating organisms from activated sludge systems

AUTHOR(S): Maurer, M.; Gujer, W.; Hany, R.; Bachmann, S.

CORPORATE SOURCE: Swiss Federal Inst. Environmental Sci. and Technology, Swiss Fed. Inst. Technology, Duebendorf, CH-8600,

SOURCE: Switz.  
Water Research (1997), 31(4), 907-917  
CODEN: WATRAG; ISSN: 0043-1354  
PUBLISHER: Elsevier  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB A biochem. model for the anaerobic and aerobic carbon flow in phosphorus accumulating organisms (PAO) is discussed. It is based on the assumption that for the anaerobic poly(hydroxyalcanoates) (PHA) storage the redn. power is delivered by glycogen and the energy is supplied with hydrolysis of glycogen or polyphosphate. These have to be regenerated under aerobic or anoxic conditions which requires energy and releases carbon dioxide. Batch expts. with activated sludge from a pilot plant fed with domestic wastewater were preformed. 13C (in the form of acetate) was added and traced with solid state carbon NMR. The anaerobic formation of intracellular PHA from metabolized acetate together with degraded glycogen and the aerobic conversion of PHA to **glycogen** could be **detected**. The low ratio of acetate to carbohydrate conversion and the **detection** of poly(**hydroxyvalerate**) formed from **glycogen** shows that there is a substantial anaerobic breakdown of glycogen for energy prodn. The results from the NMR spectra also indicate that glycogen is degraded via the Entner-Doudoroff pathway. From the model it can be concluded that the maintenance of a glycogen and polyphosphate pool reduces the growth yield on substrate. This redn. depends on the type of substrate. It is estd. that for acetate there is a loss of biomass yield of about 12% as compared to strictly aerobic conditions. The model also shows that glycogen as well as polyphosphate may serve for anaerobic energy supply, however with acetate as the only carbon source, polyphosphate is essential for growth.

L47 ANSWER 29 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN

ACCESSION NUMBER: 97:597699 SCISEARCH

THE GENUINE ARTICLE: XP686

TITLE: **Acinetobacter** isolates from different  
**activated sludge** processes:

Characteristics and neural network identification

AUTHOR: Kim M H; Hao O J (Reprint); Wang N S

CORPORATE SOURCE: UNIV MARYLAND, DEPT CIVIL ENGN, COLLEGE PK, MD 20742  
(Reprint); UNIV MARYLAND, DEPT CIVIL ENGN, COLLEGE PK, MD 20742; UNIV MARYLAND, DEPT CHEM ENGN, COLLEGE PK, MD 20742

COUNTRY OF AUTHOR: USA

SOURCE: FEMS MICROBIOLOGY ECOLOGY, (JUL 1997) Vol. 23, No. 3, pp. 217-227.

Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE  
AMSTERDAM, NETHERLANDS.

ISSN: 0168-6496.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: LIFE; AGRI

LANGUAGE: English

REFERENCE COUNT: 38

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB **Acinetobacter** species were isolated from various full-scale **activated sludge** processes based on their abilities to transform an **Acinetobacter** calcoaceticus BD413 trp E27 auxotroph. Approximately half of the **Acinetobacter** isolates (149 out of 282 isolates) were able to accumulate polyphosphate, and some used P-**hydroxybutyrate** as a sole carbon and energy source. Additionally, most of the **Acinetobacter** isolates were unable to reduce **nitrate**. These characteristics of **Acinetobacter**

species are desirable for microorganisms responsible for enhanced phosphorus removal in different **activated sludge** processes. The backpropagation neural network technique was further applied to assign the isolates to distinct **Acinetobacter** genospecies based on their phenotypic characteristics. In particular, **Acinetobacter johnsonii** was consistently the major genospecies from different samples obtained from the enhanced phosphorus removal processes or the conventional plant without biological phosphorus removal.

L47 ANSWER 30 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN  
 ACCESSION NUMBER: 97:557280 SCISEARCH  
 THE GENUINE ARTICLE: XL573  
 TITLE: The characterization and description of representatives of 'G' bacteria from **activated sludge** plants  
 AUTHOR: Blackall L L (Reprint); Rossetti S; Christensson C; Cunningham M; Hartman P; Hugenholtz P; Tandoi V  
 CORPORATE SOURCE: UNIV QUEENSLAND, DEPT MICROBIOL, ADV WASTEWATER MANAGEMENT CTR, BRISBANE, QLD 4072, AUSTRALIA (Reprint); CNR, WATER RES INST, ROME, ITALY; ACAD SCI CZECH REPUBL, INST HYDROBIOL, CR-37005 CESKE BUDEJOVICE, CZECH REPUBLIC  
 COUNTRY OF AUTHOR: AUSTRALIA; ITALY; CZECH REPUBLIC  
 SOURCE: LETTERS IN APPLIED MICROBIOLOGY, (JUL 1997) Vol. 25, No. 1, pp. 63-69.  
 Publisher: BLACKWELL SCIENCE LTD, OSNEY MEAD, OXFORD, OXON, ENGLAND OX2 0EL.  
 ISSN: 0266-8254.  
 DOCUMENT TYPE: Article; Journal  
 FILE SEGMENT: LIFE; AGRI  
 LANGUAGE: English  
 REFERENCE COUNT: 24

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The name *Tetracoccus cecii* is proposed for two strains of the tetrad arranged cocci, previously known as 'G' bacteria, which were isolated from laboratory scale **activated sludge** plants in the Czech Republic and in Italy. They were morphologically, phenotypically and phylogenetically characterized and found to comprise a novel lineage in the alpha-3 group of the **proteobacterial** phylum in the domain Bacteria. The strains are Gram-negative and produce intracellular inclusions of poly-beta-hydroxybutyrate. Although commonly seen in **activated sludge** mixed liquor as cocci 1-2  $\mu$ m in diameter, arranged in tetrads, in pure culture they can also grow in amorphous aggregations and the cells are generally more variable in their size and shape with coccobacilli as well as cocci being present. They are not able to grow phototrophically, nor can they reduce **nitrate** beyond **nitrite** nor grow anaerobically. The closest phylogenetic neighbours of *T. cecii* are *Rhodobacter sphaeroides* and *R. capsulatus* which are 93% similar by 16S rDNA comparison. *Tetracoccus cecii* is oxidase- and catalase-positive, non-motile and has an optimal growth temperature between 25 degrees and 35 degrees C. The 16S rRNA of *T. cecii* has a 21 nucleotide deletion in the V9 region (*Escherichia coli* positions 1258-1278) and this feature is a unique molecular synapomorphy in the alpha-3 group.

L47 ANSWER 31 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 10  
 ACCESSION NUMBER: 1996:705914 HCAPLUS  
 DOCUMENT NUMBER: 125:326487  
 TITLE: Biosynthesis of poly(3-hydroxybutyrate-co-3-hydroxyvalerate) from structurally unrelated



single carbon sources by newly isolated  
**Pseudomonas** sp. EL-2  
 AUTHOR(S): Son, Hongjoo; Lee, Sangjoon  
 CORPORATE SOURCE: Dep. Microbiology, Pusan National Univ., Pusan,  
 609-735, S. Korea  
 SOURCE: Biotechnology Letters (1996), 18(10), 1217-1222  
 CODEN: BILED3; ISSN: 0141-5492  
 PUBLISHER: Chapman and Hall  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB A **Pseudomonas** sp. EL-2 strain capable of synthesizing poly(3-  
**hydroxybutyrate-co-3-hydroxyvalerate**) [P(3HB-co-3HV)]  
 was isolated from **activated sludge**. For simulation of  
 P(3HB-co-3HV) prodn. in the cells, a deficiency of nutrients such as NH<sub>4</sub><sup>+</sup>,  
 SO<sub>4</sub><sup>2-</sup>, and Mg<sup>2+</sup> was crucial and the max. content of P(3HB-co-3HV) could  
 reach 46% on NH<sub>4</sub><sup>+</sup>-deficient medium. This organism synthesized  
 P(3HB-co-3HV) with 3HV monomer in the range from 1.9 to 49.3 mol% from  
 unre lated single carbon sources such as glucose, fructose, propionate, or  
 sorbitol. P(3HB-co-3HV)s contg. a higher fraction of 3HV were produced by  
 adding propionic acid to glucose medium.

L47 ANSWER 32 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
 DUPLICATE 11

ACCESSION NUMBER: 1997:173206 BIOSIS  
 DOCUMENT NUMBER: PREV199799470919  
 TITLE: Production of polyhydroxyalkanoates by Azotobacter  
 chroococcum H23 in **wastewater** from olive oil  
 mills (alpechin.  
 AUTHOR(S): Gonzalez-Lopez, J.; Pozo, C.; Martinez-Toledo, M. V.;  
 Rodelas, B.; Salmeron, V.  
 CORPORATE SOURCE: Group Environ. Microbiol., Dep. Microbiol., Fac. Pharmacy,  
 Inst. Water Res., Univ. Granada, Granada Spain  
 SOURCE: International Biodeterioration & Biodegradation, (1996)  
 Vol. 38, No. 3-4, pp. 271-276.  
 ISSN: 0964-8305.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English  
 AB We describe the production of large **amounts** of homo- and  
 copolymers of **polyhydroxyalkanoates** (PHAs) by Azotobacter  
 chroococcum strain H23 when growing in culture media amended with  
 alpechin. A. chroococcum grown on NH<sub>4</sub><sup>+</sup>-medium supplemented with alpechin  
 formed PHAs up to 50% of the cell dry weight after 24h. The results show  
 that alpechin supports the growth of strain H23 and also that this waste  
 could be utilized as a carbon source. Production of PHAs by using alpechin  
 looks promising, since the use of inexpensive feed-stocks for PHAs is  
 essential if bioplastics are to become competitive products.

L47 ANSWER 33 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 12

ACCESSION NUMBER: 1997:4004 HCAPLUS  
 DOCUMENT NUMBER: 126:147831  
 TITLE: Studies on polyphosphate and poly-.beta.-  
 hydroxyalkanoate accumulation in **Acinetobacter**  
 johnsonii 120 and some other bacteria from  
**activated sludge** in batch and  
 continuous culture  
 AUTHOR(S): Weltin, D.; Hoffmeister, D.; Dott, W.; Kaempfer, P.  
 CORPORATE SOURCE: Tech.Univ. Dresden, Dresden, D-01062, Germany  
 SOURCE: Acta Biotechnologica (1996), 16(2-3), 91-102  
 CODEN: ACBTDD; ISSN: 0138-4988

PUBLISHER: Akademie Verlag  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Bacterial isolates of the genera **Acinetobacter** and **Pseudomonas** from a sewage treatment plant with enhanced biol. P removal (EBPR) were screened for P uptake, polyphosphate accumulation, and adsorption under limited C and N conditions. Poly- $\beta$ -hydroxyalkanoate prodn. was studied under C, N, P, and O limitation. The results indicate that the EBPR process cannot be defined by simply applying the knowledge of the metabolic processes, obsd. or assumed in pure cultures, to the complexity of the process in sewage treatment plants.

L47 ANSWER 34 OF 52 SCISEARCH COPYRIGHT 2003 THOMSON ISI on STN

ACCESSION NUMBER: 96:485588 SCISEARCH

THE GENUINE ARTICLE: UT348

TITLE: ANAEROBIC MICROBIAL-DEGRADATION OF POLY(3-HYDROXYALKANOATES) WITH VARIOUS TERMINAL **ELECTRON ACCEPTORS**

AUTHOR: BUDWILL K; FEDORAK P M; PAGE W J (Reprint)

CORPORATE SOURCE: UNIV ALBERTA, DEPT BIOL SCI, EDMONTON, AB T6G 2E9, CANADA (Reprint); UNIV ALBERTA, DEPT BIOL SCI, EDMONTON, AB T6G 2E9, CANADA

COUNTRY OF AUTHOR: CANADA

SOURCE: JOURNAL OF ENVIRONMENTAL POLYMER DEGRADATION, (APR 1996) Vol. 4, No. 2, pp. 91-102.  
ISSN: 1064-7546.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: ENGI

LANGUAGE: ENGLISH

REFERENCE COUNT: 60

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The microbial degradation of poly (3-hydroxyalkanoates) (PHAs) under anaerobic conditions with various terminal electron accepters was examined. **Nitrate**-reducing consortia were established using **activated sludge**, and PHAs were shown to be biodegradable under these conditions. A positive correlation between carbon dioxide production and **nitrate** reduction was demonstrated. **Nitrous oxide** accumulated as the main N-containing product of **nitrate** reduction. The amount of PHAs in **activated sludge** cultures decreased approximately 20% within 40 days of incubation. Attempts were made to establish iron- and **sulfate**-reducing consortia from spring water, yet it could not be demonstrated that the mixed cultures were capable of degrading PHAs. Pure cultures of iron- and **sulfate**-reducing bacteria could not utilize PHAs as sole carbon sources. Methanogenic environments sampled included pond sediment and rumen fluid. PHAs were fermented to methane and carbon dioxide after 10 weeks by a sediment consortium, with 43 to 57% of the substrate carbon transformed to methane. Although it could not be demonstrated that PHAs were biodegraded by a rumen fluid consortium, a facultative anaerobic bacterium, identified as a *Staphylococcus* sp., that could grow on PHAs was isolated from rumen fluid.

L47 ANSWER 35 OF 52 MEDLINE on STN

DUPLICATE 13

ACCESSION NUMBER: 95362679 MEDLINE

DOCUMENT NUMBER: 95362679 PubMed ID: 7635832

TITLE: **Phosphate concentration** regulates transcription of the *Acinetobacter* **polyhydroxyalkanoic** acid biosynthetic genes.

AUTHOR: Schembri M A; Bayly R C; Davies J K

CORPORATE SOURCE: Department of Microbiology, Monash University, Clayton,  
Victoria, Australia.  
SOURCE: JOURNAL OF BACTERIOLOGY, (1995 Aug) 177 (15) 4501-7.  
Journal code: 2985120R. ISSN: 0021-9193.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
OTHER SOURCE: GENBANK-L37761  
ENTRY MONTH: 199509  
ENTRY DATE: Entered STN: 19950921  
Last Updated on STN: 19980206  
Entered Medline: 19950913

AB The **polyhydroxyalkanoic** acid (PHA) biosynthetic gene locus was cloned and characterized from an *Acinetobacter* sp. isolated from **activated sludge**. Nucleotide sequence analysis identified three clustered genes, *phaAAc* (encoding a beta-ketothiolase), *phaBac* (encoding an acetoacetyl coenzyme A reductase), and *phaCAc* (encoding a PHA synthase). In addition, an open reading frame (ORF1) with potential to encode a 13-kDa protein was identified within this locus. The sequence of the putative translational product of ORF1 does not show significant similarity to any sequences in the database. A plasmid containing the *Acinetobacter* *pha* locus conferred the ability to accumulate poly-beta-**hydroxybutyrate** on its *Escherichia coli* host. These genes appear to lie in an operon transcribed by two promoters upstream of *phaBac*, an apparent constitutive promoter, and a second promoter induced by phosphate starvation and under *pho* regulon control. These as well as a number of additional potential transcription start points were identified by a combination of primer extension and promoter-chloramphenicol acetyltransferase gene fusion studies carried out in *Acinetobacter* or *E. coli* transformants.

L47 ANSWER 36 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
DUPLICATE 14

ACCESSION NUMBER: 1995:251696 BIOSIS  
DOCUMENT NUMBER: PREV199598265996  
TITLE: Production of poly-beta-hydroxybutyrate by *Azotobacter chroococcum* H23 in chemically defined medium and alpechin medium.  
AUTHOR(S): Martinez-Toledo, M. V.; Gonzalez-Lopez, J. (1); Rodelas, B.; Pozo, C.; Salmeron, V.  
CORPORATE SOURCE: (1) Dep. Microbiol., Fac. Pharm., Univ. Granada, 18071 Granada Spain  
SOURCE: Journal of Applied Bacteriology, (1995) Vol. 78, No. 4, pp. 413-418.  
ISSN: 0021-8847.  
DOCUMENT TYPE: Article  
LANGUAGE: English

AB *Azotobacter chroococcum* H23 is able to produce large **amounts** of poly-beta-**hydroxybutyrate** (PHB) during growth in chemically-defined medium (N-free or with NH<sub>4</sub><sup>+</sup>) and alpechin (**wastewater** from olive oil mills) medium. Polymer production was not dependent of the nutrient limitation. Strain H23 was capable of accumulating PHB up to 70% of the cell dry weight after 24 h incubation in chemically-defined media containing 1% glucose, fructose, mannitol, saccharose or starch. *Azotobacter chroococcum* grown on NH<sub>4</sub><sup>+</sup>-medium supplemented with alpechin formed PHB up to 50% of the cell dry weight after 24 h, suggesting that these wastes could be utilized by *Azotobacter* as a cheap substrate for producing PHB.

L47 ANSWER 37 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1995:840939 HCAPLUS  
 DOCUMENT NUMBER: 123:236747  
 TITLE: State and parameter estimation for phosphorus removal in an alternating activated sludge process  
 AUTHOR(S): Zhao, Hong; Kuemmel, Mogens  
 CORPORATE SOURCE: Dep. Chem. Eng., Technical Univ: Denmark, Lyngby, DK-2800, Den.  
 SOURCE: Journal of Process Control (1995), 5(5), 341-51  
 CODEN: JPCOEO; ISSN: 0959-1524  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB This paper presents an application of state and parameter estn. techniques for an altering activated sludge process with regard to biol. P removal. A simplified model describing the P dynamics in the alternating activated sludge process is proposed based on insight into the process with a mechanistic activated sludge model. State and parameter estn. problems relating to the non-measurable dynamics of **polyhydroxyalkanoate** (PHA) are formulated and discussed. Several schemes are presented which involve a state estimator designed with the extended Kalman filter algorithm, 2 specific parameter estn. procedures and an adaptive scheme for simultaneous state and parameter estn. All these schemes are oriented to practical application and therefore some techniques dealing with the implementation are also provided. Simulations and exptl. demonstrations are presented which illustrate the performance of these procedures and schemes.

L47 ANSWER 38 OF 52 EMBASE COPYRIGHT 2003 ELSEVIER SCI. B.V. on STN

ACCESSION NUMBER: 95187959 EMBASE  
 DOCUMENT NUMBER: 1995187959  
 TITLE: A metabolic model for the biological phosphorus removal process.  
 AUTHOR: Smolders G.J.F.; Van Loosdrecht M.C.M.; Heijnen J.J.  
 CORPORATE SOURCE: Department Biochemical Engineering, Delft University of Technology, Julianalaan 67, 2628 BC Delft, Netherlands  
 SOURCE: Water Science and Technology, (1995) 31/2 (79-93).  
 ISSN: 0273-1223 CODEN: WSTED4  
 COUNTRY: United Kingdom  
 DOCUMENT TYPE: Journal; Conference Article  
 FILE SEGMENT: 046 Environmental Health and Pollution Control  
 LANGUAGE: English  
 SUMMARY LANGUAGE: English

AB A structured metabolic model of the biological phosphorus removal process has been developed. In this approach the model is based on the bioenergetics and stoichiometry of the metabolism. All relevant metabolic reactions underlying the P-metabolism, considering also ATP and NADH<sub>2</sub>, are described. The derived set of stoichiometry based linear relations is used to reduce the number of reactions and conversions rates required to describe the process. The model predictions were experimentally verified by measurement of the external acetate, **phosphate** and **ammonium concentrations** as well as the internal fractions of PHB and **glycogen**. The model is applied to dynamic and steady-state situations over a wide range of sludge ages. The derived structured metabolic model is very well capable of describing the complex conversions of the biological phosphorus removal process.

L47 ANSWER 39 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 15

ACCESSION NUMBER: 1994:416917 HCAPLUS  
 DOCUMENT NUMBER: 121:16917  
 TITLE: Role of glycogen in acetate uptake and polyhydroxyalkanoate synthesis in anaerobic-aerobic activated sludge with a minimized polyphosphate content  
 AUTHOR(S): Liu, Wen Tso; Mino, Takashi; Nakamura, Kazunori; Matsuo, Tomonori  
 CORPORATE SOURCE: Dep. Urban Eng., Univ. Tokyo, Tokyo, 113, Japan  
 SOURCE: Journal of Fermentation and Bioengineering (1994), 77(5), 535-40  
 CODEN: JFBIEX; ISSN: 0922-338X  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB The role of glycogen in the uptake of AcO<sup>-</sup> in anaerobic-aerobic activated sludge without enhanced biol. P removal were investigated. Although the polyphosphate content of the sludge was minimized by lowering the P feeding concn., significant acetate uptake and accumulation of polyhydroxyalkanoates (PHAs) were obsd. in proportion to glycogen consumption under anaerobic conditions. The results of anaerobic inhibition studies, which showed suppressive effects on AcO<sup>-</sup> uptake by a glycolysis inhibitor (iodoacetate) but not by a membrane ATPase inhibitor (N,N'-dicyclohexyl carbodiimide), supported an assumption that glycogen degrdn. through glycolysis supplies the required ATP and reducing power for PHA synthesis from acetate and consumed glycogen. Under subsequent aerobic conditions, the accumulated PHAs were depleted and the consumed **glycogen** recovered to the same **level** as that at the start of cumulated PHAs were depleted and the consumed **glycogen** recovered to the same **level** as that at the start of the anaerobic phase. Iodoacetate also inhibited the recovery of glycogen under aerobic conditions, suggesting that nearly 50% of the PHAs depleted was used for glycogen synthesis through reversed glycolysis.

L47 ANSWER 40 OF 52 MEDLINE on STN DUPLICATE 16  
 ACCESSION NUMBER: 93236410 MEDLINE  
 DOCUMENT NUMBER: 93236410 PubMed ID: 8476295  
 TITLE: Degradation of poly(3-hydroxyoctanoic acid) [P(3HO)] by bacteria: purification and properties of a P(3HO) depolymerase from **Pseudomonas fluorescens** GK13.  
 AUTHOR: Schirmer A; Jendrossek D; Schlegel H G  
 CORPORATE SOURCE: Institut fur Mikrobiologie, Georg-August-Universitat Gottingen, Germany.  
 SOURCE: APPLIED AND ENVIRONMENTAL MICROBIOLOGY, (1993 Apr) 59 (4) 1220-7.  
 Journal code: 7605801. ISSN: 0099-2240.  
 PUB. COUNTRY: United States  
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
 LANGUAGE: English  
 FILE SEGMENT: Priority Journals  
 ENTRY MONTH: 199305  
 ENTRY DATE: Entered STN: 19930604  
 Last Updated on STN: 19930604  
 Entered Medline: 19930518  
 AB Twenty-five gram-negative bacteria and one gram-positive bacterium capable of growing on poly(3-hydroxyoctanoic acid) [P(3HO)] as the sole source of carbon and energy were isolated from various soils, lake water, and **activated sludge**. Most of the isolates degraded only P(3HO) and copolymers of medium-chain-length (MCL) hydroxyalkanoic acids (HA). Except for the gram-positive strain, which was able to hydrolyze

P(3HO) and poly(3-**hydroxybutyric** acid) [P(3HB)], no isolate was able to degrade polymers of short-chain-length HA, such as P(3HB) or poly(3-**hydroxyvalerate**) [P(3HV)]. All strains utilized a large variety of monomeric substrates for growth. All gram-negative strains, but not the gram-positive strain, accumulated poly(hydroxyalkanoic acids) (PHA), consisting of MCL HA, if they were cultivated under accumulation conditions. One strain, which was identified as **Pseudomonas fluorescens** GK13 (biovar V), was selected and the extracellular P(3HO) depolymerase of this strain was purified from the culture medium of P(3HO)-grown cells by chromatography with Octyl-Sepharose CL4B and by gel filtration with Superose 12. The relative molecular weights of the native and sodium dodecyl **sulfate**-treated enzymes were 48,000 and 25,000, respectively. The purified enzyme hydrolyzed P(3HO), copolymers of MCL HA, and para-nitrophenyl esters of fatty acids. P(3HB), P(3HV), and characteristic substrates for lipases, such as Tween 80 or triolein, were not hydrolyzed. The P(3HO) depolymerase of *P. fluorescens* GK13 was insensitive to phenylmethylsulfonyl fluoride and dithioerythritol, unlike other PHA depolymerases. The dimeric ester of 3-hydroxyoctanoic acid was identified as the main product of enzymatic hydrolysis of P(3HO). (ABSTRACT TRUNCATED AT 250 WORDS)

L47 ANSWER 41 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 17  
 ACCESSION NUMBER: 1993:251170 HCAPLUS  
 DOCUMENT NUMBER: 118:251170  
 TITLE: Production of poly-.beta.-**hydroxybutyrate** in **Acinetobacter** spp. isolated from **activated sludge**  
 AUTHOR(S): Rees, Gavin N.; Vasiliadis, George; May, John W.; Bayly, Ronald C.  
 CORPORATE SOURCE: Dep. Microbiol., Monash Univ., Clayton, 3168, Australia  
 SOURCE: Applied Microbiology and Biotechnology (1993), 38(6), 734-7  
 CODEN: AMBIDG; ISSN: 0175-7598  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Two strains of **Acinetobacter** sp. isolated from **activated sludge** actively removing **phosphate** were examd. for their abilities to produce poly-.beta.-**hydroxybutyrate** (PHB). When yield-limited by **phosphate**, strain RA3117 contained material that stained with Sudan Black, but contained only 0.9% PHB on a dry wt. basis. This strain contained no sudanophilic material or PHB when limited by **ammonia** or **sulfate**. When strain RA3757 was limited by **phosphate**, **ammonia**, or **sulfate**, it produced 2.0, 7.8, and 11.5% PHB, resp., on a dry wt. basis. .beta.-Ketothiolase and acetoacetyl-CoA reductase were only obsd. in RA3757 cell-free exts. .beta.-Ketothiolase was produced both in cells with and without PHB, whereas acetoacetyl-CoA reductase was found only in cells accumulating PHB. When RA3757 was grown in **ammonia**-limiting medium with acetate, butyrate, caproate, or ethanol as carbon source, similar levels of PHB were produced. When cells were grown on valerate, RA3757 produced 5.6 poly-.beta.-**hydroxyvalerate** and 0.9% PHB on a dry wt. basis.

L47 ANSWER 42 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 18  
 ACCESSION NUMBER: 1993:142267 HCAPLUS  
 DOCUMENT NUMBER: 118:142267  
 TITLE: Degradation of poly(3-**hydroxybutyrate**), PHB, by bacteria and purification of a novel PHB

depolymerase from *Comamonas* sp  
 AUTHOR(S): Jendrossek, Dieter; Knoke, Ingrid; Habibian, Rahim  
 Bahodjb; Steinbuechel, Alexander; Schlegel, Hans  
 Guenter  
 CORPORATE SOURCE: Inst. Mikrobiol., Georg-August-Univ., Goettingen,  
 3400, Germany  
 SOURCE: Journal of Environmental Polymer Degradation (1993),  
 1(1), 53-63  
 CODEN: JEPDED; ISSN: 1064-7546  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Bacteria capable of growing on poly(3-hydroxybutyrate), PHB, as  
 the sole source of carbon and energy were isolated from various soils,  
 lake water, **activated sludge**, and air. Although all  
 bacteria utilized a wide variety of monomeric substrates for growth, most  
 of the strains were restricted to degrade PHB and copolymers of 3-  
**hydroxybutyrate** and 3-hydroxyvalerate, P(3HB-co-3HV).  
 Five strains were also able to decomp. a homopolymer of 3-  
**hydroxyvalerate**, PHV. Poly(3-hydroxyoctanoate), PHO, was not  
 degraded by any of the isolates. One strain, which was identified as  
*Comamonas* sp., was selected, and the extracellular depolymerase of this  
 strain was purified from the medium by **ammonium sulfate**  
 pptn. and by chromatog. on DEAE-Sephacel and Butyl-Sepharose 4B. The  
 purified PHB depolymerase was not a glycoprotein. The relative mol.  
 masses of the native enzyme and of the subunits were 45,000 or 44,000,  
 resp. The purified enzyme hydrolyzed PHB, P(3HB-co-3HV), and-at a very  
 low rate-also PHV. **Polyhydroxyalkanoates**, PHA, with six or more  
 carbon atoms per monomer or characteristic substrates for lipases were not  
 hydrolyzed. In contrast to the PHB depolymerases of *Pseudomonas*  
*lemoignei* and *Alcaligenes faecalis* T1, which are sensitive  
 toward PMSF and which hydrolyze PHB mainly to the dimeric and trimeric  
 esters of 3-hydroxybutyrate, the depolymerase of *Comamonas* sp.  
 was insensitive toward PMSF and hydrolyzed PHB to monomeric 3-  
**hydroxybutyrate**, indicating a different mechanism of PHB  
 hydrolysis. Furthermore, the pH optimum of the reaction catalyzed by the  
 depolymerase of *Comamonas* sp. was in the alk. range at 9.4.

L47 ANSWER 43 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 19  
 ACCESSION NUMBER: 1993:131152 HCAPLUS  
 DOCUMENT NUMBER: 118:131152  
 TITLE: Polyphosphate and poly-.beta.-hydroxybutyrate  
 production in *Acinetobacter* spp. isolated  
 from **activated sludge**  
 AUTHOR(S): Rees, G. N.; Vasiliadis, G.; May, J. W.; Bayly, R. C.  
 CORPORATE SOURCE: Dep. Microbiol., Monash Univ., Clayton, 3168,  
 Australia  
 SOURCE: Water Science and Technology (1992), 26(9-11, Water  
 Qual. Int. '92, Pt. 5), 2213-15  
 CODEN: WSTED4; ISSN: 0273-1223  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Three strains of *Acinetobacter* from **activated**  
**sludge** were examd. for their capacities to produce polyphosphate  
 and poly-.beta.-hydroxybutyrate (I) following growth under  
 PO43-, NH3, and SO42- limitation. When growing on complete medium, levels  
 of polyphosphate produced by strain RA3117 were .apprx.6 times higher than  
 in strain RA3757 and levels were unchanged when growing on NH3 or SO42-  
 limitation. Strain RA3197 produced polyphosphate only when subjected to  
 SO42- limitation. No strain produced polyphosphate when growing under

PO43- limitation. When the 3 strains were grown in normal medium at 100% O satn., no strain produced I. When subjected to PO43-, NH3 or SO42- limitation RA3757 produced .ltoreq.10% I as dry wt. Strains RA3117 and RA3197 produced moderate amts. of sudanophilic material only when grown under PO43- limitation, however, only trace levels of PHB were detected. In RA3757 levels of the 1 synthesizing enzymes (.beta.-ketothiolase and acetoacetyl-CoA reductase)-correlated well with I prodn. but in strains RA3117 and RA3197 no activity of either of the enzymes was obsd.

L47 ANSWER 44 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
 ACCESSION NUMBER: 1992:492973 BIOSIS  
 DOCUMENT NUMBER: BR43:102173  
 TITLE: METABOLISM OF ORGANIC SUBSTANCES IN ANAEROBIC PHASE OF BIOLOGICAL PHOSPHATE UPTAKE PROCESS.  
 AUTHOR(S): MATSUO T; MINO T; SATO H  
 CORPORATE SOURCE: DEP. URBAN ENGINEERING, UNIVERSITY TOKYO, 7-3-1 HONGO, BUNKYO-KU, TOKYO 113, JPN.  
 SOURCE: INTERNATIONAL ASSOCIATION ON WATER POLLUTION RESEARCH AND CONTROL SPECIALIZED SEMINAR ON INTERACTIONS OF WASTEWATER, BIOMASS AND REACTOR CONFIGURATIONS IN BIOLOGICAL TREATMENT PLANTS, COPENHAGEN, DENMARK, AUGUST 21-23, 1991. WATER SCI TECHNOL, (1992) 25 (6), 83-92.  
 CODEN: WSTED4. ISSN: 0273-1223.  
 FILE SEGMENT: BR; OLD  
 LANGUAGE: English

L47 ANSWER 45 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN  
 DUPLICATE 20  
 ACCESSION NUMBER: 1993:113874 BIOSIS  
 DOCUMENT NUMBER: PREV199395057974  
 TITLE: Additional characteristics of the polyphosphate-accumulating Acinetobacter strain 210A and its identification as Acinetobacter johnsonii.  
 AUTHOR(S): Bonting, C. F. C.; Willemsen, B. M. F.; Akkermans-Van Vliet, W.; Bouvet, P. J. M.; Kortstee, G. J. J. (1); Zehnder, A. J. B.  
 CORPORATE SOURCE: (1) Dep. Microbiol., Agric. Univ. Wageningen, Hesselink van Suchtelenweg 4, NL-6703 CT Wageningen Netherlands Antilles  
 SOURCE: FEMS (Federation of European Microbiological Societies) Microbiology Ecology, (1992) Vol. 102, No. 1, pp. 57-64. ISSN: 0168-6496.  
 DOCUMENT TYPE: Article  
 LANGUAGE: English

AB Acinetobacter strain 210A, a non-motile, strict aerobic, rod shaped bacterium was isolated from **activated sludge** in 1980. The strain was unambiguously identified as Acinetobacter johnsonii, using a combination of biochemical and genetic properties. The organism was able to synthesize polyphosphate as well as poly-beta-**hydroxybutyric** acid during growth in batch cultures. Storage of these reserve polymers depended on the amount of phosphate in the growth medium. At excess phosphate, polyphosphate was formed. The amount of phosphate accumulated was about 4 mg P/100 mg dry weight and was unaffected by the 'energy content' of the substrates tested. Poly-beta-**hydroxybutyric** acid was formed when phosphate was the limiting nutrient. Cells grown in media with an initial **phosphate concentration** of 30 mu-M contained 13% (w/w) poly-beta-**hydroxybutyric** acid. Intact cells were able to oxidize a variety of monosaccharides in the presence of PQQ. Disaccharides were not oxidized, neither in intact cells nor in cell-free extracts. The strain contained several plasmids.



L47 ANSWER 46 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1992:57566 HCAPLUS

DOCUMENT NUMBER: 116:57566

TITLE: Manufacture of poly(3-hydroxybutyrate) with activated sludge

INVENTOR(S): Saito, Yuji; Tomosawa, Takashi; Sato, Katsuo; Niimura, Yasuko; Shibayama, Masako

PATENT ASSIGNEE(S): Taisei Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 03236784	A2	19911022	JP 1990-31584	19900214
PRIORITY APPLN. INFO.:			JP 1990-31584	19900214

AB Poly(3-hydroxybutyrate) (I) is manufd. in culture media that suppress the prodn. of **glycogen** by **controlling** the org. C concn. in the media. Activated sludge [contg. mixed liquor suspended solid (MLSS) 4000 mg/L] (150 mL) and 150 mL Na acetate-based substrate soln. [contg. 10 g/L total org. C (TOC) and 20 mg/L N] were mixed, and the prodn. rate of I and glycogen examd. The max. I prodn. rate [.apprx. 80 mg as C/(g C of MLSS)/h] was obsd. when the TOC was 2.5 g/L. No prodn. of glycogen was obsd. at the same TOC concn.

L47 ANSWER 47 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1991:253342 HCAPLUS

DOCUMENT NUMBER: 114:253342

TITLE: Role of glycogen as an intracellular carbon reserve of activated sludge in the competitive growth of filamentous and non-filamentous bacteria

AUTHOR(S): Matsuzawa, Y.; Mino, T.

CORPORATE SOURCE: Dep. Urban Eng., Univ. Tokyo, Tokyo, 113, Japan

SOURCE: Water Science and Technology (1991), 23(4-6), 899-905

CODEN: WSTED4; ISSN: 0273-1223

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Activated sludge mixed cultures were cultivated with a glucose contg. substrate in order to investigate the relationship between the feeding pattern (continuous or intermittent feeding) and the glycogen reservation capacity of activated sludge. An exptl. method to **measure** the max. capacity of **glycogen** reservation in the sludge was developed. Sludge with higher glycogen reservation capacity has an ability to synthesize glycogen faster, which ensures the higher glucose uptake. Therefore, sludge which has high glycogen reservation capacity becomes predominant in intermittently fed reactors. When the feeding pattern was changed from continuous feeding to intermittent feeding, a filamentous bacterium, Type 1701, started to decrease and a gram pos. tetrad coccus became predominant. When the feeding pattern was returned to continuous feeding, Type 1701 re-appeared. Type 1701 has lower glycogen reservation capacity than the tetrad coccus. Therefore, the former cannot dominate over the latter in intermittently fed reactors.

L47 ANSWER 48 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1989:559583 HCAPLUS

DOCUMENT NUMBER: 111:159583  
 TITLE: The isolation and characterization of volutin granules as subcellular components involved in biological phosphorus removal  
 AUTHOR(S): Heymann, J. B.; Eagle, L. M.; Greben, H. A.; Potgieter, D. J. J.  
 CORPORATE SOURCE: Natl. Inst. Water Res., CSIR, S. Afr.  
 SOURCE: Water Science and Technology (1989), 21(4-5), 397-408  
 CODEN: WSTED4; ISSN: 0273-1223  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB The main compds. occurring in the volutin granules from **Acinetobacter calcoaceticus** were polyphosphate and poly-.beta.-hydroxybutyrate (PHB), together with nucleic acids, metal cations, and some protein. Two types of granules were found, based on the predominant compd., and were denoted and P- and L-volutin granules. P-volutin granules are P-rich while L-volutin granules consist largely of PHB. L-volutin was formed in a medium supplying sufficient nutrients, while P-volutin formed after induction of the P-accumulating app. by P-starvation. In biol. P removal, PHB is synthesized under anaerobic conditions and degraded during aeration, while P accumulation follows a complementary pattern. The exact significance of the formation of the 2 types of granules is not clear, although their formation under different conditions in **Acinetobacter** suggests a similar mechanism to that operational in **activated sludge** processes.

L47 ANSWER 49 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1988:183408 HCAPLUS  
 DOCUMENT NUMBER: 108:183408  
 TITLE: Metabolic control in polyphosphate-accumulating bacteria and its role in enhanced biological phosphate removal  
 AUTHOR(S): Lotter, L. H.; Dubery, I. A.  
 CORPORATE SOURCE: City Health Dep., Johannesburg, 2000, S. Afr.  
 SOURCE: Biol. Phosphate Removal Wastewaters, Proc. IAWPRC Spec. Conf. (1987), 7-14. Editor(s): Ramadori, R. Pergamon: Oxford, UK.  
 CODEN: 56FJAN  
 DOCUMENT TYPE: Conference  
 LANGUAGE: English

AB Various aspects of the metabolic control exercised in **Acinetobacter** were studied. The effect of different carbon sources on polyphosphate kinase revealed the interdependence of polyphosphate accumulation and the nature of the carbon source. Growth on two different types of carbon sources affects the proteins synthesized by **Acinetobacter**, but does not influence chem. modification of the proteins. The oxidn. states of nicotinamide coenzymes NAD and NADP were shown to **control** enzymes involved in **polyhydroxybutyrate** metab. and normal carbon metab. Feedback inhibition by some metabolites was also obsd. The significance of these controls in relation to phosphate removal is discussed.

L47 ANSWER 50 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN

ACCESSION NUMBER: 1987:15546 HCAPLUS  
 DOCUMENT NUMBER: 106:15546  
 TITLE: Metabolic behavior of **Acinetobacter** spp. in enhanced biological phosphorus removal - a biochemical model  
 AUTHOR(S): Wentzel, M. C.; Lotter, L. H.; Loewenthal, R. E.; Marais, G. R.  
 CORPORATE SOURCE: Dep. Civ. Eng., Univ. Cape Town, Rondebosch, 7700, S.

SOURCE: Afr.  
Water SA (1986), 12(4), 209-24  
CODEN: WASADV; ISSN: 0378-4738

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A biochem. model is presented that explains the behavior of Acinetobacter in enhanced biol. P removal activated sludge systems. The model modifies and extends the proposals of Comeau et al. (1985). Two key parameters are identified in **controlling** polyphosphate and poly-.beta.-**hydroxybutyrate** synthesis and degrdn., the ATP/ADP and NADH/NAD ratios. The predicted behavior is consistent with that obsd.

L47 ANSWER 51 OF 52 HCAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 21

ACCESSION NUMBER: 1986:163226 HCAPLUS

DOCUMENT NUMBER: 104:163226

TITLE: Toxicity and biochemical responses of carp to dinitrobenzene plant effluent

AUTHOR(S): Kumar, N. Jothi; Krishnamoorthi, K. P.; Rao, D. M. R.

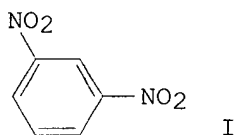
CORPORATE SOURCE: Cent. Environ. Sci. Eng., Indian Inst. Technol., Bombay, 400 076, India

SOURCE: Water, Air, and Soil Pollution (1986), 28(1-2), 117-26  
CODEN: WAPLAC; ISSN: 0049-6979

DOCUMENT TYPE: Journal

LANGUAGE: English

GI



AB The effect of 1,3-dinitrobenzene (I) [99-65-0] **wastewater** on carp (Cyprinus carpio) was studied. The effluent was toxic even at low concn. with medium lethal concn. of 0.052% at 96 h. Various biochem. responses such as O consumption, NH3 excretion, and protein, **glycogen** [9005-79-2], and lipid contents were **measured**. The effect of this I-contg. effluent on carp reduces O consumption and NH3 excretion and also interferes with the metab. of the fish. The high toxicity of the effluent is attributed to the combined effect of a mixt. of nitroaroms. present in the effluent.

L47 ANSWER 52 OF 52 BIOSIS COPYRIGHT 2003 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1983:163417 BIOSIS

DOCUMENT NUMBER: BA75:13417

TITLE: AN EXTRACELLULAR POLY-3 HYDROXY BUTYRATE DEPOLYMERASE FROM **ALCALIGENES**-FAECALIS.

AUTHOR(S): TANIO T; FUKUI T; SHIRAKURA Y; SAITO T; TOMITA K; KAIHO T; MASAMUNE S

CORPORATE SOURCE: DEP. HEALTH CHEMISTRY, FAC. PHARMACEUTICAL SCI., KYOTO UNIV. SAKYO, KYOTO-SHI, KYOTO-FU, JPN. 606.

SOURCE: EUR J BIOCHEM, (1982) 124 (1), 77-78.  
CODEN: EJBCAI. ISSN: 0014-2956.

FILE SEGMENT: BA; OLD

LANGUAGE: English

AB A strain of A. faecalis T1, which was isolated from **activated**

**sludge**, excreted an extracellular poly(3-**hydroxybutyrate**) depolymerase as it grew in a medium containing poly(3-**hydroxybutyrate**) as the sole C source. The MW of the enzyme, purified from the culture medium to electrophoretic homogeneity, was 48,000 as determined by Sephadex G-100 filtration, and 50,000 by polyacrylamide gel electrophoresis in the presence of sodium dodecyl **sulfate**. The pH optimum for the enzyme reaction was 7.5. The purified enzyme depolymerized poly(3-**hydroxybutyrate**) purified from *Zoogloea ramigera* I-16-M, but did not attack the bacterial native poly(3-**hydroxybutyrate**)-containing granules.  $K_m$  values were 13.3  $\mu\text{g/ml}$  ( $= 0.78 \mu\text{M}$ , based on an estimated average MW of 17,000) for poly(3-**hydroxybutyrate**) and 5.4 mM for the trimeric ester of D(-)-3-**hydroxybutyric** acid. Analysis of hydrolytic products of poly(3-**hydroxybutyrate**), several oligomeric esters of D(-)-3-**hydroxybutyric** acid, and the methyl ester of the trimeric ester indicated that the enzyme hydrolyzed these substrates from the free hydroxyl terminus, releasing D(-)-3-**hydroxybutyrate** dimer units one at a time.